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INDUSTRIAL SERIES

Safety Supervision

BY

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SAFETY SUPERVISION

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PREFACE

The purpose of this book is to discuss the human element involved in the problems of the supervisor who must promote the safety of the workers in his division. It is not a discussion of the engineering problems of safety or of the conventional problems of keeping accident records and making accident reports.

It is evident that careful safety engineering practices must not be neglected. A safe working place should be assured, careful guarding and ventilation should be checked. There is no excuse for poor housekeeping or lack of regulations; but these problems are covered in other texts. It is the purpose of this book to point out the necessity for, and some of the techniques in, good safety supervision.

The supervisor's problem is to persuade his workmen to follow safe practices. He must know the relation of human reactions, emotions, habits, and personality to the scenes he sets when he teaches safe practices. Selection, placement, and training of workers for their specific jobs are involved and are discussed here in relation to every department of industry. Practical situations are viewed and methods of dealing with them are pointed out. The discussion follows the principles of good management applicable to other areas of industrial management as well as to the specific field of safety supervision.

This book is one of the series of texts prepared by members of the staff of the Extension Services of The Pennsylvania State College. It has been used in the

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form of mimeographed notes in industrial groups in the several centers where the College has conducted extension classes for adults, but is now being offered in book form to meet the increased demand.

The author wishes to thank N. V. B. Ziegler of the Aluminum Company of America for the inspiration he provided for the first approach to this material. He also wishes to express appreciation to the members of his classes in Safety for their persistent demand for discussion of the problems dealt with in this volume and to his associates on the Extension staff for their helpful suggestions.

VERNON G. SCHAEFER.

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SAFETY SUPERVISION

CHAPTER I

MANAGEMENT RESPONSIBILITY AND SAFETY PROMOTION

Responsibility for the safety and health of the men he supervises is one of the important items in the job of every supervisor. Safety has come to be considered as one of the important problems, not only in industry, but in the home, at school, and on the highway. Everywhere we see the posters and other reminders that warn us against hazards, accidents, and unsafe practices. The problem is of interest not only from the human viewpoint, but also from the viewpoint of financial loss through spoiled and damaged material, loss of earning capacity, and destroyed property.

That there is a growing interest in the promotion of safety is evident. Schools are teaching it in regularly organized courses and in extracurricular activities. Insurance companies, automobile manufacturers, and automobile associations are promoting safety. State and local governments, in their various branches, are passing and enforcing laws in the hope of eliminating unsafe practices in various ac-

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tivities of life. Local and national associations, organizations, and councils are formed and at work in the promotion of safety in the many and varied fields of life. Industry has so realized the importance of accident prevention and the promotion of safe practices that almost every industrial plant has a well-established department of its management devoted to safety. The safety engineer holds a respected position in the organization.

What may be said of accidents in industry may be said of accidents in general. The causes are much the same; the results are similar. Although this text is an attempt primarily to analyze the problem of accident prevention and safety promotion in industry, it is probably true that the most important facts brought out here are also related to accident prevention and to safety promotion in general.

The Human Viewpoint.—The safety problem looms up as being very important when we stop to think of the tremendous loss of life due to accidents. Besides those who lose their lives, there are many who are totally and permanently disabled, more who are temporarily disabled, and still more who are the victims of minor injuries, any one of which could possibly have resulted in a fatality.

There are between 16,000 and 17,000 occupational fatalities each year in the United States. This is only a part of the total number of fatal and lost-time injuries. We must add 32,400 highway deaths and 31,500 deaths in the home, and many more from various fields of activity rather difficult to classify.

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The annual number of accidents in the United States mounts to the astounding total of approximately 100,000 deaths and 5,500,000 injuries.

Certainly from a humane viewpoint it is time something was being done to study the accident problem. Safety must be promoted.

Cost Viewpoint.—From an economic point of view something must be done to reduce accidents. In industry, costs of production are influenced by lost-time injury and fatality. For every man who must be replaced, a new man must be trained. If it costs \$300 to replace the average man, industry must charge between \$5,000,000 and \$6,000,000 in additional costs per year to its products. A further charge is made to take care of compensation payments demanded by law.

Since there are approximately 50,000 permanent disability and over 1,000,000 personal injury cases each year, the above figure is only a small amount of the actual costs of accidents to industry. The estimated loss for 1939, including wage loss, medical expense, and overhead cost of insurance, totaled approximately \$600,000,000. The loss of earning power to society is even greater, and the loss of skill due to decreased production is difficult to estimate.

These losses fall upon the employee, through loss of time and wages; upon the employer, through labor turnover, friction with employees, legal expenses, and compensation payments; and upon society, through decreased productivity and the necessity of caring for the dependents of the injured.

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If one should fail to be interested in the problem from the purely humane point of view, he is, nevertheless, forced to attend to it from the viewpoint of costs. It has become a problem that industry cannot ignore if its products are to meet the competition of the open market and yield a profit, or if industry expects to meet the demand for increased production for present defense needs. Every machine must be guarded, every unnecessary hazard removed, and every man given proper training and proper supervision.

Responsibility of Top Management.—Industrial management is responsible for the conservation of skill and man power and for the safety of every employee. There may have been a time when this responsibility could be dodged by saying that everyone was responsible for himself and for the guarding of his own life and limb. That time is past. The social order places responsibility for safety upon the supervisor. Government, through its laws, places responsibility for safety upon the supervisor. The necessity for reduced cost of production, to assure profit to the owner, demands greater safety. The present demand for increased production to meet national defense needs makes imperative the conservation of skill and man power by close attention to the safeguarding and proper safety supervision of every employee.

In industry, top management cannot escape the responsibility of safeguarding against every hazard,

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and providing proper supervision as concerns safety for every employee. That responsibility may be delegated to the immediate supervisor or foreman. It should be delegated to the representative of management who is at the point of contact with the worker. Therefore every foreman, assistant foreman, and group leader should know how to and be able to promote safety among the employees he supervises. This means not only that top management must provide the most expert safety engineering possible, but also that every supervisor must be trained and backed by top management in the promotion of safety in his department.

Responsibility of the Foreman.—Top management does delegate the responsibility for safety to the foreman or supervisor who is at the point of contact with the workman. That responsibility is his, whether or not top management provides guards for machines, safe tools, and a properly constructed plant. It is his even if top management seems to lack interest or fails to back him in his safety activities. Men in top management positions may fail in some instances. The foreman cannot escape by offering their failure as his excuse for not reducing accidents or failing to promote safe conditions and safe practices in his department.

The foreman's responsibility is twofold. He must promote safety on the part of his men and he must keep management informed and promote safety on the part of management above him. In most in-

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stances the management is far more interested than the foreman believes. Too often, he uses the wrong approach in making suggestions and giving information which he is in the best position to obtain and pass along.

In promoting safety in his department he must provide not only safe tools and safeguard equipment, but also competent, intelligent, firm, and sympathetic supervision for the workers after he has given them careful and complete training. If materials are available, by far the greatest "bottle-neck" to safe and efficient production in industry is the failure on the part of foremen to train properly and supervise properly their workers.

Safety Engineering and Safety Supervision.—There can be no excuse for failure to provide safe working conditions when safety is such an important factor from both the cost viewpoint and the viewpoint of effective production. It is costly not to guard machines. It is costly to use unsafe tools. It is costly to fail to provide safe and healthful working conditions. It is more expensive to produce under unsafe conditions than under safe conditions. Safe production and efficient production are one and the same thing. The most correct and effective methods of production are usually the safest methods and over a period of time the most safe methods are always the most effective and least costly.

Men may have poor safety records and show inefficient production even when proper safety engineering has safeguarded every hazard. On the other

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hand, it is very difficult to produce safely and rapidly when safety engineering is neglected. Top management must provide the engineering activities to assure safety. The foreman must so supervise that the human element is controlled in the direction of safety, quantity, and quality as regards production.

Often safety engineering is taken to mean provision of proper equipment and working conditions, and good supervision. Certainly the two are inter-related parts of the problem of safe production. It would be foolish to say which is the more important. Machines must be guarded, proper working conditions must be established, and men must be trained to use them properly. Tools must be in good condition and interest developed in men to use them safely and correctly. Work surroundings must be favorable and proper attitudes developed. In every detail, the engineering and the human element or supervision problem are inextricably tied together.

In the organization setup of present-day industry, the engineering problem is taken care of by one division of the staff and the supervision by direct line supervisors. Since this is the case, the duty of the foreman is usually to point out to his superior the need for attention to the engineering phases of his safety responsibilities, and to assume and discharge personally the responsibility of control of the human element in the safety problem by careful supervision.

This book is written especially for the line supervisor who deals with the human side of safety di-

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rectly; the engineering problems of safety are more directly the province of the special staff officer or department designated by top management. By no means can we lose sight of the fact that, while the foreman is developing better techniques for dealing with the human side of the problem, he must also be constantly aware of his responsibility for informing and cooperating with the safety engineer.

By the nature of his job as a supervisor of the human beings in his department and by the structure of industrial organization, the foreman is made indirectly responsible for the engineering problems and directly responsible for the correct techniques of dealing with the human element. To discharge this responsibility, whether he be a special safety supervisor, a line foreman, an assistant foreman, or a group leader, he must know human nature as it is exhibited in himself and others with whom he deals in a supervisory capacity. He must know the effect of the kind of stimulus he gives. He must know what response he wants and how to get it. He must know the habits of his men and how to change them. He must know how to develop interest and attitudes and to build morale. He must know what causes accidents and how to remove the causes. He must know the effect of his personality on the men he supervises and how to adjust, so that he can sell his ideas of safety to those above him as well as to the workers he supervises. He is that part of the management that contacts the human element in the production process. If that human element is to be

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properly dealt with so that man power is conserved, skills retained, and production increased, he must do the job intelligently and wisely.

Industrial management is then responsible for complete and adequate safety engineering and for proper supervision. The engineering responsibility may be discharged chiefly by specialists. The supervisory responsibility will never be discharged unless it is done by the members of management who are in direct contact with the workers. There may be staff safety supervisors but, to be finally effective, safety promotion and accident prevention must be carried on by the immediate line supervisor, whatever be his abilities, level of intelligence, or personal qualifications. If he is not good enough to carry out safety supervision, he is not good enough to be a foreman. Whatever he may lack, he is still the only one who can do an effective job, for he is in closest touch with his workers. If he lacks knowledge, he must be trained. If he is a foreman, he must be respected. His responsibility must be made clear. When faith in his ability to discharge it is shown, he will rise to the challenge.

To the end of developing a better understanding of the human side of safety and the duties of safety supervision, the following chapters are devoted.

Promoting Safety.—In many industrial organizations there is evidence of great ability of safety engineers and even of the line supervisors to safeguard machines and to teach correct methods of operation. Yet there is often in these apparently

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well-organized and well-kept plants a lack of safe activity and of enthusiasm for accident prevention. The machines are guarded and the floors are clean but accidents occur. The men know how to operate safely but they operate unsafely. Management is ready and willing to make any improvements suggested but none are suggested. All the elements for a good safety program seem to be present except those that provide vitality for the form and structure of a lifeless organization. Some way must be found to put life into the program. In fact, a program must be planned. Unity of purpose must be attained. Interest must be guided into proper channels. In short, a program of accident prevention and safety must be promoted.

It has been pointed out that management is responsible for the safety of the worker. If that safety cannot be assured by engineering activities alone or if those activities themselves are neglected, it is evident that some means must be devised to make safe practice and accident prevention a vital part of the program of every worker as well as of the men in top management who may have been brought to see their responsibility clearly. Many things have been tried in the attempt to promote vital and effective safety programs. Most of the attempts have proved that some program is better than no program. However, very few programs have been successful unless the workers were permitted and encouraged to become a part of them and to contribute heavily to them by means of suggestions, active participa-

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tion, and the assumption of promotional responsibility. Let us examine some of the methods used and factors relating to safety promotion.

Safety Posters.—Early in the movement to interest workers in accident prevention and safe practice, safety posters were devised. At first, these posters were chiefly of two types: they consisted mainly of words of advice to be careful and to avoid danger, or they portrayed the results of a typical accident. Neither type was very positive in direction. More recently posters have been made colorful and positive in their appeal. The one who reads or views them is prompted by picture, cartoon, or words to do something. The negative appeal is not nearly so prevalent as it formerly was.

There is no doubt that the better safety posters have been helpful in promoting an interest in accident prevention and safe practice. The safety-first signs and symbols have become a part of the very language of many workers. However, it is wise for supervisors and safety directors to call direct attention to the meaning of safety signs and posters from time to time. Too often they are not read, and more often they have no meaning to the person who reads them.

The chief difficulty with posters as a means of promoting safety is that they do not provide for the personal activity of the worker in the safety promotion program. They are management's tool to promote something and as such are passively accepted at best.

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Safety Films.—Safety films and sound movies are coming into use. These may prove of more value than the posters. They provide for a greater variety of scenes and ideas to be presented. They fall into a class with commercial entertainment and therefore have a greater interest appeal. Perhaps of greater value than anything else is the fact that, since they are usually viewed by groups, people get together and are guided into a common viewpoint. A common appeal is made and a common interest is aroused. It is then comparatively easy to promote safety when that common interest is tied into the job either by the film itself or by a wise supervisor.

Care should be exercised in the selection of safety films to avoid the teaching of incorrect practice. Some of them may be well done as concerns the major point that was intended, but often they are not carefully checked as concerns other parts of the scenes. The acting is too often done by professional actors rather than by well-trained workmen.

If films are used in promoting safety, they should be used as aids for instruction rather than as means of entertainment or digression from the real point to promote safety. If this can be done by pleasurable means, so much the better. However, if the means used distracts the attention from safety to some other point of interest, there is little value to the method used.

Safety Meetings.—The safety meeting in the department is usually a very effective way of promoting interest in the safety program and of teaching

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safe practice. It is also a means of revealing hazards that may be corrected and unsafe operation methods that should be revised. These advantages are gained, however, only if the meeting is properly conducted. The supervisor must be prompt and courteous. The meeting must be carefully planned. The workers must be given opportunity to do the talking. Every suggestion they make must either be carried out or the reason why it cannot be carried out explained.

The "all plant" safety meeting, the safety dance, or the safety picnic sometimes prove valuable in developing a feeling of group solidarity. Inspiration and enthusiasm are provided which, if turned into the right channels, will do much to promote safety. Rarely does this inspiration or enthusiasm carry over to the job on the following morning unless the supervisor does something to tie it into the actual and specific activities on the job of the individual workers. This does not mean that such meetings are not valuable. It only means that the greatest value from a good safety meeting or safety party will be gained if and when it is properly followed up by specific application to the job.

Safety Committees.—The formation of worker safety committees, either departmental or plant wide, is usually an effective way to increase worker interest in safety. The worker who serves on such a committee assumes greater responsibility for himself and his fellows. The members suggest methods for improving working conditions which, from their

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position, are evident to them; but all the workers begin to feel that the safety program is theirs and for their benefit. They no longer look upon safety as management's means of making more profit or obtaining more glory for itself. They become interested in safety because they are in the program. When they are thus interested, the supervisor finds little difficulty in directing activity in correct and safe practice.

Many companies have found that rotating the membership on the safety committee is a good idea. More workers get a chance to participate and thus more of them become interested. The members may be workers only or a combination of representatives from the workers and from the management. In either case there must be a means whereby the suggestions of the committee are transmitted to management where they may be decided upon.

Suggestions from Men to Management.—Almost every worker could give some very good suggestions for improving safety conditions if he were encouraged or permitted to do so. Almost every management group is anxious for these suggestions if it could but find a way to get them. Suggestion boxes have been used and men have been paid extra for good safety suggestions to encourage them to think about safety and to get them to submit their ideas for improvement of methods and conditions.

Inviting boxes, fancy schemes, and pay for ideas and suggestions are not necessary to obtain suggestions from men for their own well-being and safety.

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These things may help if other factors are present. Certainly it is a mark of the company's interest if it is willing to pay for ideas that will return it a profit. However, if certain other factors are not considered carefully, no petty amount of prize money will tempt some of the workers to suggest anything.

To keep suggestions coming, two things are necessary. First, you must accept with appreciation and give some recognition to every suggestion made to you. Second, you must make the changes or put into effect at once the techniques for all acceptable suggestions and explain fully and carefully to the individuals making the suggestions why the others have not been adopted. Never should this explanation belittle the one making the suggestion, nor should it praise him too highly. If he is told in a frank but kindly manner why his suggestion is not being used, he is often led to think of a better one. Probably the greatest suggestion killer is the practice of putting into effect the suggestion of a workman and giving credit for it to his supervisor. Always give credit where it is due. Keep a record of the suggestions made and who made them. If they are ever used, be sure that credit is given to the right person.

There should be a complete plan understood by all supervisors for getting safety suggestions from workmen to top management in the cases where those suggestions cannot be acted upon by the immediate foreman or intermediate levels of supervi-

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sion. The man has a right to have his suggestion recognized and reviewed, and top management has a right to receive that suggestion. Some day we may learn that it is just as important to have a recognized and definite channel and method for dealing with suggestions as it is to have a definite setup for dealing with grievances. If we had a good suggestion-handling system, there would be less need for such an elaborate grievance-handling machinery for the safety cases that end up as grievances.

Reduction of Insurance Premium.—The appeal to workmen to reduce accidents because reduction results in lower compensation insurance premiums is usually a dangerous argument to use in promoting safety. The idea of gaining recognition at state or national safety conferences is also not especially effective as a means of promoting safety or preventing accidents. When these things are the by-products of safe practice and effective accident prevention programs, they stand as the just reward for honest effort. When they become the ends to be sought after regardless of the means by which they are attained, there is some doubt as to whether safety will not be defeated.

There is no quarrel with the management that frankly states that there is a desire to reduce insurance premiums by reducing accidents. But all too often the accidents are "hidden" to avoid having them show in the records and the individual is exposed to undue hazards such as dangers from infection and difficult adjustment to a new job. Cov-

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ering up accidents and failing to report them may make the record look good for the present. Insurance premiums may be reduced and honors may be presented at safety conferences. However, there are two other results. First, the morale of the workmen who know of these cover-up practices is destroyed and they lose respect for management. Second, management spends more time in punishing offenders and covering up results than in seeking the causes of accidents and ways to eliminate them. Both of these conditions lead very quickly to an increased accident rate and the premiums on compensation insurance quickly follow the upward trend.

Not all the mistakes along this line are made by top management. Some foremen attempt to hide accidents and fail to report them because they wish to maintain a good record. It cannot be done for long; men will rebel and accident rates will go up in the department. The only sure way to attain recognition for safety over a long period of time is to report every accident, study the cause of each, and remove the causes so that other accidents will be prevented. Then honors will follow and insurance rates will drop.

Further, it is doubtful if the appeal to the average worker on the basis of greater saving to the company in insurance premiums would cause him to be much interested in safety. It is more likely that he would see the gain to the company much more readily than he would see his own, and he would wonder why he should be at all interested in saving insurance

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premiums for the company. If the appeal to reduce accidents in order to reduce compensation insurance premiums is made, be sure the worker sees clearly how that will benefit him. It may actually benefit him in several ways. His personal safety is more assured. His job may be more secure because the company is on the profit side of the ledger. He may receive more pay. If you cannot show how the worker will benefit by the reduction of insurance premiums, do not use that method of promoting safety.

The Most Important Factors in Safety Promotion.—Whatever the methods used in promoting safety, there are always three very important factors in the promotion of an industrial safety program. The foreman must be a party to the plan; the worker must have a part in the program; and there must be a worth-while program.

No safety director, however capable, can ever promote a safety program alone in an organization where he cannot have frequent and direct contact with every man. The foreman, on the other hand, represents the company to the average worker. To him the company is as his foreman is. If he promotes safety in his department, the company is interested. If he is left out of the safety program, either safety must be no good or the foreman is weak. Thus, both because he has the closest contact with the worker and because his interest in safety is proof of company interest in the subject, no industrial organization can afford to by-pass the

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foreman in promoting safety. It is better to accept his plan and aid him in developing it than to force some more ideal plan upon him which he is not prepared to develop.

Every foreman must also do all he can to promote safety and to make his plan conform to that of the expert in safety. If he does not, he will soon lose the following of his own workers as they begin to think of him as being incapable of discharging all his supervisory responsibilities. Thus, for the promotion of safety as well as for general effectiveness of production, every level of line supervisor and all staff supervisors must be included as cooperating partners in the responsibilities of supervision. Least of all can the immediate supervisor of any worker be left out of the plan or by-passed if the worker is to be expected to respect activities and ideas of top management. The foreman's plan is the most acceptable to the men. If you are a foreman, develop a plan under the advice of the safety experts in your plant.

The second extremely important factor in any safety promotion scheme is that the worker be given a part in the program to which he is expected to subscribe. If he is actively engaged in the program, he must, to maintain self-respect, attempt to get others to subscribe to the program. Too often we only tell the worker he has a part in the program. But he does not believe it. When he is given a chance to show his own good qualities, he is likely

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to promote any program that provides the means whereby he can express himself.

No amount of supervisory enthusiasm or worker self-pride tied together in a safety promotion program will ever go very far unless the program finally deals with the specific working conditions, hazards, and safe and unsafe practices of the individuals in the plant. An accident-prevention program must eventually reduce the accident rate or the program will degenerate and die. A safety program must sooner or later result in an increase of positive safe practice or it becomes hollow and meaningless. There must, therefore, be both a well-planned organization and specific points of contact with the actual job methods, conditions, and procedures in a successful safety program. Safe production must be the end result by which the methods and techniques of safety promotion and safety supervision are finally judged.

CHAPTER II

ORGANIZATION FOR SAFETY

The place of safety in the organization is often a problem. In many industries there is no definite organization setup for safety. The responsibility supposedly rests on everybody and too often apparently rests on no one in particular. Who really is responsible for safety in an industrial organization? The usual answer is, everybody. This is correct just as much as it is correct to say everyone is responsible for doing his assigned job. In supervision, however, the line supervisor is advised in many of his activities by staff supervisors who are supposed to be experts in their special fields. Thus the foreman is advised and aided in the selection of men by the personnel director, and in the problems of rate setting by the industrial engineer. Likewise, in safety problems, the safety director and the safety engineer may be helpful in studying the problems and giving expert advice.

- **The Need for Experts in Safety.**—It is assumed that the production foreman cannot know all the latest methods, techniques, and procedures involved in selection, training, rating, collective bargaining, job evaluation, rate setting, production techniques,

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machine adjustments, and maintaining the plant and equipment. He is given expert advice in most of these. No one man can find time to know the latest and most effective procedures in all these things. Concerning production, industry has long accepted the necessity for experts to act in research and advisory capacity in various areas of the field of management.

More recently, industrial management has seen the necessity for staff supervisors who are specialists in safety engineering and supervision. This does not mean that the foreman is relieved of the responsibility of maintaining safe conditions and promoting safe practices on the part of the workers.

So long as there was no great pressure, demanding more effective production at lower per unit cost, there was no evidence of a need for experts in production control. As soon as competition became sharp and prices were standardized, it became evident that specialists were needed to study and promote better methods of production, better cost control, and more efficient planning. It was evident to management that profit, the margin between production costs and overhead on the one hand and selling price on the other, could only be assured by the most effective activity and control in the area of production. Staff advisers were soon taken on in this area and quickly proved their worth to the organization.

Safety was not considered as having any effect on profit. Safety was the responsibility of the indi-

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vidual worker and the assumed moral responsibility of those in management who were in close contact with human suffering in case of accident. This was not sufficient to cause the appointment of any expert to study and advise on the problem. More pressure was required.

The first pressure came in the form of compensation legislation superimposed by political government, when the politicians were moved by the cries of distress of workmen and the pleading of social reformers and propagandists. With the advent of more stringent compensation laws, it became more and more expensive to have accidents, and profits were diminished. This, however, resulted chiefly in the demand for compensation insurance, and safety reached the stage of accident-record keeping. Then came the realization that accidents must be kept down to avoid increased insurance rates. The first attempt was in the direction of more careful guarding of machines, the proper care of tools, and the reconstruction, or safeguarding, of plant structures.

The safety movement was on. Specialists were attached to industrial management staffs. These early experts were safety engineers and safety record-keepers. In many cases the latter were given the title "superintendent of compensation."

Many of these early safety staff men were moved by the human suffering which they were forced by their jobs to notice. Because they were often highly humane, they turned their interest to reducing the accident toll.

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It was quickly discovered that the reduction of accidents was accompanied by results other than reduced insurance rates. Costs of production were reduced, production was increased, and the morale of the working force showed improvement. As soon as it became evident that efficient production and safe production were synonymous, industry as a whole subscribed to the safety movement. Safety directors were appointed in all types of industrial plants from coast to coast. Experts were as necessary in this as in any other area of production.

The need for experts in safety had been firmly established, from both the human viewpoint and the viewpoint of costs. Foremen had to be helped in their safety problems. Men were called in to study plant layout, machine guarding, safe production methods, and proper control of the human element. At first these were private consultants who came in to give their advice, much as the efficiency expert of former years had done concerning quantity production methods. As in the case of the efficiency experts, who were soon replaced by permanently employed industrial engineers, the outside safety consultants are now fast being replaced by safety specialists, permanently assigned to the staff of the organization. There is no longer any doubt that safety engineering and safety supervision are needed. *They pay dividends.*

To put into effect the best practices in both the engineering and supervisory areas, a great amount of research and study is required. To assure con-

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stant and continual promotion of safety at all times in every department, supervisors, relieved of other duties and specializing in an advisory capacity in the area of safety only, are needed. To do this research and study, to plan and advise properly, and to promote continually, specialists are needed who must be expert in their fields to obtain the best results. Thus the need for experts in safety, as staff advisers in every industry, becomes evident.

The Duties and Qualifications of the Safety Director.—Whether it is owing to happy circumstance or to plan and forethought, the term “safety director” is an excellent one. It indicates at once the duties of the person who holds the office; it defines and limits his responsibilities and authority at the same time that it delegates them to him.

— The safety director is a staff officer, responsible for proper methods and procedures of safeguarding safety supervision, accident prevention, and safety promotion in the organization in which he is appointed. He is the director of these activities. The final and direct responsibility for safe practice, accident prevention, and safe working conditions and surroundings rests upon the line supervisor in direct control of those whom he supervises.

The complaint we have heard so often is that the average foreman is too busy or too inadequate in ability or knowledge to discharge his safety responsibilities. The contention then, on the part of top management and especially by some of the overambitious safety directors, is that the foreman should

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be by-passed. This is a futile, false, and fatal notion. Never should the foreman be by-passed. He probably is busy. He may be less able and less informed than the safety director. But he is the only one who has the directness of contact necessary to discharge the safety responsibility in his department. The safety director's duty is to inform him, to advise him, to guide him, and to work with him in the discharge of those responsibilities.

In a company employing 320 men, the foreman with 32 men in his department has opportunity for twenty times as many fifteen-minute contacts with each man in a given period of time as the safety director who spends half of his time in the plant making direct personal contacts. If there are 3,200 employees, the foreman makes 200 times as many contacts; if one safety director were given the task of contacting 32,000 employees, the figure jumps to 2,000 times as many contacts per man by his foreman as by the safety director. Even in the small plant, it is evident that no one safety director can take direct charge of the safety of every worker. The foreman who is in almost constant contact is the only one in the position to enforce safe practice. The duty of the safety director is to pass information on to the foreman, and to train him or provide opportunity for proper training for him as concerns safety.

The number of contacts possible is not the only point of importance. A far more important reason exists why the safety director should work through

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the foreman rather than around him. The promotion of anything requires acceptance of the one we consider to be the leader. If the safety director by-passes the foreman and makes a good impression on the workman, the foreman is at once belittled in the sight of that worker. That foreman can no longer promote safety; he is all wrong. Unless the ideas come directly from the safety director, they can be no good. The foreman himself too often makes the assumption that he is relieved of the responsibility for safety when the safety director by-passes him by going directly to his men. In either case the cause of everyday safe practice and accident prevention in that department suffers.

If the safety director does not succeed in winning the respect of individuals at the expense of the foreman when the director by-passes the foreman, the respect for top management represented by the safety director suffers. This can do safety much harm. The foreman in turn, although his workers still respect him, finds it hard to convince his men that they should support the program of accident prevention for a management which they do not respect.

However, if the safety director promotes the interest and enthusiasm of the foreman and offers him helpful suggestions when he is prepared and trained to receive them, and then permits the foreman to carry out the program to the best of his increased ability and knowledge, the worker's respect for both the foreman and top management is increased. The

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foreman is doing something about safety, and to the average worker his foreman represents not only the company but every level of management. Furthermore, the foreman must rise to meet the challenge when the safety director works with him. This causes him to increase his respect for the safety director and to take renewed interest in the discharge of his responsibilities.

There are times when the safety director must do more than offer advice. He must get the results of his study and research put into practice. Too often, when this becomes evident, the safety director gets a mistaken notion of his duty. It is not his duty to beat the foreman into acceptance of his ideas, be they ever so good. He should not command. He has no "line" supervisory authority. His point of entry into the direct line of authority, which flows from the general superintendent down to the foreman in charge of the worker, is through the superior to whom he reports. This superior is usually a line supervisor who can, and does, exercise direct authority. The duty of the safety director then is to sell his ideas to the line supervisor to whom he reports. If he is expert enough in this, as well as in his ability to study the accident and safety problems at hand, his ideas will reach the foreman as orders from the proper source.

The intelligent and considerate safety director usually does not find it necessary to have his ideas passed down through the channels of authority. He must always report to his superior. But he will find

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the foremen, almost to a man, ready and anxious to cooperate with him and to take his words of advice as if they were commands, if he is courteous and cooperative and if he really has something valuable to offer them. He may act as if he had authority when such conditions prevail, but he must never flaunt that practical working-basis type of authority granted by a cooperative foreman in the face of the foreman who grants it, because he respects his ability and needs his help.

Types of Organization for Safety.—The type of organization, or the place of the safety director in the organization, and the type of authority and responsibility delegated to each level of supervision must depend to some degree upon the type of industry and the personalities of the various people involved. It is doubtful if there is any "one best" type of organization for accident prevention and safety promotion. The proof of the pudding is in the eating. In this case, if accidents are reduced and the workers are following safe practices and attentively promoting safety, the organization is a good one. On the other hand, if a different type of organization could assure better results, the old organization is not justified.

There is a small plant in Pittsburgh where an assistant foreman is the safety director for the plant, and the safety record is excellent. The company organization chart shows him as an assistant foreman. In this plant, his other duties as an assistant foreman are very few. The ~~production manager is des~~

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ignated by the owner of the company as the person to attend to safety. A highly paid safety director is neither necessary nor within the limits of financial expediency. John, the assistant foreman, was doing an excellent safety job in his department and he asked if he could not help the production manager along the lines of safety. The production manager was willing, and the five foremen and the four assistant foremen all like and respect John. He has studied safety from every angle. He gives expert advice. He has reduced accidents almost to the point of eliminating them. He directs safety. He is qualified for a job as safety director in a larger organization. But he will not leave, because he has a financial interest in the company as well as many years of pleasant service and an absorbing and interesting job with security for the future. Who can say that this plant does not have a good organization for safety? The personality of the individual, the conditions of his own financial affairs, and the peculiarities of the company make it possible for a man listed as an assistant foreman on the organization chart to fill all the duties and qualifications of the expert safety director.

This does not mean that we advise making an assistant foreman the staff safety director in every organization. On the contrary, in most of the larger organizations it is our belief that the safety director should be given a position in the organization where he reports directly to the production manager or the general superintendent. The nearer he is to the top,

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the easier he may enter into the line of authority when that becomes necessary. More respect for safety is shown by management when safety is given an important place in the organization plan. This is usually reflected in the form of more respect for accident prevention and safety on the part of the employee.

It is not always possible or practicable to have the safety director report to the general superintendent. Some companies are set up in such a manner that it becomes more practicable to have a safety director report to each division head. In other cases the safety director reports to the personnel director, who in turn is a staff officer and reports to the production manager.

The type of plant organization and the personality of the man who holds the position have much to do with the place the safety director is to be assigned in the organization. However, we usually find that the more direct the contact of the safety director with top management and the nearer the top, the better the type of organization and the better the results in the form of accident prevention. The least effective type of organization usually results when the staff safety director must report through several other levels of staff supervisors, before he reaches the direct line of authority. An outstanding personality is required to overcome the difficulties of such an organization plan.

A common error on the part of many industrial managements has been to put a man into the posi-

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tion of safety director with a high rank in the organization as a reward for long and faithful service elsewhere, even though he may know very little about safety. It must be remembered that the position of the name on the organization chart or the figure on the pay checks does not make an expert of a man. Good and faithful servants deserve their just reward, but it must be granted in some other way than by making them safety directors, reporting to general superintendents or even presidents, if they are not qualified. No man in top position of management would think of making "the dear old fellow" production manager if his only qualification was long and faithful service.

An error, almost as bad, is committed when an expert safety engineer or director is hired and the position in the organization is dropped several levels just because he is new and young. Keep the position high and fill it with a capable man, if good results are desired.

Most of this discussion has centered around the safety director. What of the other staff officers and line supervisors? They have, each on his own level of supervision and in his own job, a definite responsibility for the safety of those whom they supervise. The chief engineer is a staff expert and adviser, but he does not escape responsibility for the safety of the men in his department over whom he exercises direct line authority. The same is true of the personnel director or the director of research.

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Even the safety director changes from his role as adviser to direct supervisor concerning the safe practices of the men assigned to his staff, over whom he has line authority.

In the case of the various levels of line supervisors, there is an inescapable and undiminishing responsibility and a commensurate authority delegated from the very owners and the charter-granting public, concerning the safety of not only the immediate men they supervise but also of all men supervised by those to whom they delegate responsibility and authority. This is an unalterable part of the organization. Perhaps that is why it is so often taken for granted and the real responsibilities are so rarely clarified. Every management should, from time to time, make clear to every line supervisor that he is responsible to the organization for the safety of every man below him in the line through which his responsibility and authority are delegated. This responsibility cannot be diminished if the job is properly done. The departmental superintendent is just as responsible for a workman's injury as is the foreman, and the general superintendent is no less responsible than either of them. A clear and careful stare into the face of these facts may help some of us in industry to convince ourselves that accidents are the responsibility of every supervisor and that safety promotion is his duty.

What of the Foreman?—So much discussion has been spent on other supervisors and their place in

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the safety organization of the plant. Does the foreman have any place at all? Yes. He is the final and most intimate point of contact of management with the men among whom accidents must be prevented and among whom safety should be promoted. The foreman is not *management's representative* to the worker. He is not a go-between with management on one hand and the worker on the other. He is not divorced from both sides. The foreman is management at the point where it contacts a working force made up of individuals. Through him pass all the responsibilities which management, from the very top, presents to the worker. Through him pass most of the problems presented by the worker for management to face.

At the inverted apex of management his place in the organization demands that he discharge his responsibility concerning safety promotion, safety engineering, and accident prevention even though he may never receive any help or advice from staff officers in the safety field. No staff officer can relieve him of his responsibility for safety whether or not they relieve the pressure of his task by helpful advice. He is even responsible when line supervisors above him neglect their duty toward him, for neglect of duty on the part of a superior does not break the line of responsibility. It only makes responsibility more difficult and unpleasant to discharge. To be sure, he may be absolved of guilt by those at the top if his immediate superior fails him;

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but he has not escaped the actual responsibility which was his by intent of those in positions of management far above him.

The foreman bears the duty of obeying line authoritative orders, cooperating with staff advisers, and giving attention to worker suggestions concerning safety. He also bears the duty of making the organization justify itself in the results it obtains. This does not mean that he should give the boss a "piece of his mind" every second day. It means that his is the duty of reporting the degree of effectiveness of the attempts made to solve the problems of the organization; that he inform and suggest concerning possible improvements; and that he find a way to provide management above him with incentives and motivation to do the things which he, in his position of vantage, knows must be done to reduce accidents and promote safety. He has the further duty of individually making the accident-prevention program work in his department.

Any organization that gets good safety results does so when supervisors on each level are made aware of their respective responsibilities and are properly trained by the organization to discharge them. When the organization is good and the supervisors clearly understand their relative positions of responsibility and authority, the scene is set for accident prevention and safety-promotion activity. Then the safety engineer may develop his safeguards, and the capable and intelligent foreman may exercise his techniques of supervision to advantage.

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To do this he must know the men he supervises as human beings, and he must know how to deal with them so that the desired results of increased production and decreased accidents will prevail.

CHAPTER III

PERSONALITY AND SUPERVISION

A sales manager for a large corporation once said, "There are two factors which enter into the selling of commodities, services, and ideas—the value of the commodity, service, or idea, and the personality of the one selling the same."

When one considers the value of the thing to be sold, two things should be investigated. First, one must know if the thing is good, well constructed, and useful. Second, one should be sure that the person to whom the thing is being sold has need for it and can use it.

Must Sell Self to Sell Safety.—Here, we are trying to sell the idea of safety. We want men to be safety-minded and to practice safe methods of activity. From former discussions of the idea of safety and accidents, both from the humane and cost viewpoints, it is evident that the whole idea of safety promotion is not only a good thing but that it is necessary. No argument is necessary to establish the fact that safety is a good idea and that its promotion is beneficial to individuals as well as to the group organization of which they are members. Practically every industry is aware of the necessity

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for reduction of accidents, because the management of such industries is aware of both the humane and the cost viewpoints as regards accidents and their prevention.

Thus the idea of safety promotion is good and useful and is generally accepted as being necessary. Furthermore, it is not only beneficial to the larger organizations of our society, but is so because, first of all, it benefits the individuals who are the members of such organizations.

The fact that the idea is necessary and useful is not enough. A further step must be taken. Those who need and can use the idea must be made aware of the fact that they individually can use it and that they individually are lacking something that can be supplied—something that they each need. Therefore, the seemingly self-evident idea must be presented carefully, without patronizing the prospective buyer of it. He must be made aware that here is a useful idea that he needs, can use, and cannot well do without.

The supervisor who wishes to promote safety must consider himself as a salesman of an important and much-needed idea. It seems that in order to sell an idea, the supervisor must first sell himself. In order to sell himself, the supervisor must have an acceptable personality. People, with few exceptions, rarely buy anything from or accept the ideas of the persons they do not like. Children obey grudgingly, if at all, the parents and teachers whom they disrespect. Workers produce inefficiently under super-

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visors whom they dislike. This whole idea of safety can be best promoted only by leaders who are highly regarded. Men do not learn safe practices from leaders they dislike, disrespect, or disregard.

The supervisor who sells himself to his men can and does promote effective production, including both safety and efficiency. Men follow a leader they like and respect. They accept his ideas, and support him, even in the details where he may be in error because of human limitations. Some men are truly *big men* because they are accepted as leaders; others must be big men to get anything accomplished because they are viewed only as bosses to be served grudgingly. It is not so much how much you know, as how well you are accepted, that makes possible the accomplishment of what you know in the matter of promoting safe practice and the prevention of accidents.

We do not wish to say that men deliberately have accidents because they dislike their supervisors. But when they dislike their supervisors, they do things that are more likely to get them into trouble and they do not readily accept any ideas offered by such supervisors.

Acceptable Personality.—If an acceptable personality is necessary to sell the ideas of safety to workers, the question arises as to what such a personality is. It is probably impossible to give a definition of personality to which all would agree, but it may be described or explained in a manner that is fairly well understood by most of us. One attempt

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at a definition states that "personality is the effect that we have on others."

A distinction must be made between character and personality. The sum total of the characteristic habit of reaction to the things that stimulate an individual composes his conduct or his character. Personality, on the other hand, is what others attribute to that individual on the basis of what they see of his characteristic habits. What the group sees and accepts is given meaning by the group on the basis of the characteristic tendency of the attitude of the group doing the viewing.

Thus a person may be almost totally bad by common standards of judgment as far as character is concerned, and yet have a highly accepted personality because the group viewing him sees only that part of him which is not bad, and on this basis it attributes a highly acceptable personality to him. The reverse is also true, for the person of highly acceptable character may present only his poorest qualifications to a group, and thus be attributed a poor or negative personality.

Personality does not lie in the individual, for whatever he is composes his personality. Likewise it does not lie in the members of the group who view the individual. It is rather a relationship situation depending upon the two variable conditions of characteristic habits, which may or may not be fully seen or which may change, and the group acceptance and interpretation of what is seen, plus their attribution to the individual on the basis of how they ac-

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cept what they see. It is altogether possible that three groups *A*, *B*, and *C*, each seeing the same phase of the character of *X*, will each attribute a different level or degree of personality to him. Also it is possible that each group, seeing a separate phase of *X*'s characteristic traits, may attribute a positive or negative personality to him depending upon their acceptance of what they see.

It is possible to change personality by altering our characteristic habits or by changing the attitude of the group toward what it sees in us. Too many supervisors work hard to change the attitudes of workmen to favor them, instead of putting the effort to the point of making themselves more acceptable in accordance with the existing attitudes of the group by which they must be viewed, and which attributes personality to them. Although it is difficult to change our own characteristic habits, it is even more difficult to change the group way of thinking. Thus, to change personality, it is usually more economical to work on one's own habits than on the group attitudes. However, at times, it is desirable to keep the character we have, because when viewed in a long-range picture it is good. Then, if we must have our personalities attributed to us by a certain group and if we desire a positive reaction from that group, it is necessary to alter the group acceptance of what we are, by changing their attitudes.

What Does Your Group Look For?—We have dwelt at some length on the idea that, if safety is to be sold to the people about us, the individual pro-

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moting it must first sell himself. To sell himself, he must have an acceptable personality attributed to him by the group to which he is trying to present his ideas for the purpose of getting positive action in the direction of safe practice and safety-mindedness. All this leads us to the assumption that to be a leader of a group one must know the group well enough so that he may adjust himself to a point where his personality is highly acceptable to that group. The supervisor must have his personality attributed to him by his group if he is to promote safety effectively in it. He must find out what this group considers to be the qualifications of a good personaltiy and adjust himself to the point of presenting himself as possessing those qualifications. Then, and then only, may he become the true leader of his department. Then only can he promote his ideas of safety.

After he has established himself as the leader and has been granted a highly acceptable personality, he can do much to influence the way of thinking in the group which he leads. But first he must be considered by the group to be a part of it, and this comes only when there is a mutual understanding and an attribution of acceptable personality, followed by good personal relations.

At times, supervisors object to the idea that they must have their personality attributed to them by a group of workers. If you so object, you are objecting against the very nature of your job and therefore ought to look for something else to do. It is unlikely

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that your supervision will be successful unless your group is willing to follow you as a leader; it is unlikely that they will follow you as a leader unless they think you have a good personality. To them, you will never have an acceptable personality unless your characteristic habits are within the range of their acceptance, on the basis of what they think you ought to be in certain traits. You must find out what your group expects of you and strive to fulfill that expectation if you wish them to follow you and accept what you are promoting.

If safety is to be promoted through good leadership, the leader must be accepted by the group in which he promotes the cause. If he cannot make himself acceptable, even after conscientious effort, he ought to step aside and make room for someone who can get a following, because this idea of safety is really important enough to be seriously considered, even above the petty personal desires of the individuals who are opportunists, without the true enthusiasm of the cause they are in position to promote.

In promoting safety, then, it becomes evident that we must understand the people to whom we are selling it, to know on what basis they attribute to us the personality that makes it possible to sell ourselves, and thus to sell the ideas which we have. On what basis do others attribute an acceptable personality to their leaders or instructors in safety or any other activity? What are the traits that we must exhibit to sell ourselves, and what is the range

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within which those traits must be exhibited to assure us of a highly accepted personality by our group as we promote safety?

Personality Traits.—There are many so-called personality traits. One has but to examine lists of them to find that writers vary widely in their accepted lists. The present writer once made a composite list taken from such individual lists which totaled to 115 different traits. We are told by the scientific psychologist, the popular writer, our friends, and the man on the street what we must do or be, to have personality. Whom shall we believe? This may be a difficult question to answer.

The eight traits or characteristic habits here listed, which we shall further discuss, were compiled as being the ones suggested by 108 industrial workers, men and women, picked at random.

They were permitted to discuss their supervisors without being asked any direct questions. Although many reasons were given for liking or disliking the boss, only those that were mentioned by at least fifty persons are included in the following list. They are as follows:

1. Intellectual habits.
2. Physical habits.
3. Moral habits.
4. Emotional habits.
5. Dress and appearance.
6. Speech.
7. Exhibition of fairness.

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8. Exhibition of ability to direct and promote the job or idea.

Later, forty groups of supervisors, mostly foremen, were questioned. There were approximately 880 supervisors in these groups. In the case of the supervisory groups, the problem was definitely stated. They were asked to include in a list to be placed on the blackboard for further discussion the items on which they believed their workers attributed personality to them. These supervisors suggested all the items in the foregoing list. Any item offered by any member of the group was discussed and included, if agreed upon as being important by at least half of the group. Most items were agreed upon unanimously. No group included any items other than the eight listed. Twenty-one groups suggested and agreed upon all eight. Nineteen groups suggested five, six, or seven items; when the others were suggested by the leader, they agreed upon them after presentation and discussion. Of course, not every item was given equal importance in the rating by the different groups, but the agreement from group to group was extremely close.

Here, then, we have a list of the traits on the basis of which both supervisors and workers believe that the personality of a supervisor is attributed to him by those whom he supervises. Whether or not this list is all inclusive or agrees with other lists compiled in other areas of life can make little difference. The important thing is that here we find something tangible to work on as far as constructing an accept-

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able personality, as viewed by those with whom the industrial supervisor must deal. In each area of life, a similar set of factors can be obtained by careful study, to serve as a working basis for the group leader. The supervisor must always remember that it is the group that he supervises which must attribute a highly acceptable personality to him, if he is to be their successful leader in the promotion of ideas and actual performance in either efficient activity or safe practices.

Each of the items listed has been discussed at length to find, if possible, the range in which one must fit if he is to be attributed an acceptable personality by the usual industrial employee group. The range is very difficult to determine for some of them; for most items, the extremes may be designated. Further, it seems that there must be a balanced condition of the items, but that any one of them may be at an extreme if compensated for sufficiently by other characteristics. Likewise, no one item can cover up the deficiencies in all the others. Thus, a supervisor with good moral habits is still not well accepted if he is definitely unfair, does not appear and dress properly, has bad habits of speech, and is generally emotionally unstable. On the other hand, he may be somewhat unacceptable as far as any one item is concerned and yet be regarded as having a good personality if all characteristics save that one are highly acceptable. The men in his department may say as a certain group did concerning a foreman, "He is a grouch and flies off the handle

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too easily, but he is fair, knows how to tell us what to do. He's smart, you can understand him when he talks and he is a good fellow. Guess we'll just have to forgive him for his quick temper. He is a good foreman and most of us like him."

If, on the other hand, any one characteristic habit is so outstandingly unacceptable to the group that it always overshadows the others, which may be acceptable, the whole scene is discolored and the individual with such an outstanding bad habit is considered an unacceptable personality. Then he is no longer the leader of the group. He must command and as a result take the sour reward of the commander who is in constant danger of a shot in the back from his own men.

Some points of interest may be noted in examining the items in the foregoing list separately. Some of them are quite general, others rather specific. For some, the range is rather wide; for others, there is very little variation.

1. *Exhibition of Fairness.*—There is no range to this item; however, there are two points to be noted. First, some foremen or supervisors have the intent to be fair and are fair in so far as it is humanly possible, but they do not show that fairness so that it is observable. We ought to remember that exhibitionism—showing a thing just to be showing it—is looked upon with disfavor; but we also ought to be aware of the fact that the good qualities of any object or deed are best brought out in the proper setting. Some foremen definitely "hide their light

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under a bushel." There is nothing wrong in letting your fairness be seen, if you are not obtrusive and annoying in so doing. The second point to be noted is that if a consistent attempt to be fair is evident, the person who is unfair on occasion because of human error is likely to be forgiven if it does not happen too often. To be sure, there is no excuse for continuing to make the same or similar errors over and over again, but all of us are human and on occasion by error do unfair things. If the background is one of fair practice due to careful attention to detail, a particular deviation from the usual practice is likely to be overlooked if it is due to extraordinary circumstance or error.

It is well to remember that in the minds of the workers, there are no gradations, there is no range to fairness. A supervisor is designated as fair or unfair. However, even the workers recognize the fact that it is more difficult to discover whether or not some supervisors are fair than in the case of others. When the worker is in doubt on this point, he does not attribute a highly acceptable personality to the supervisor. In fact, he often attributes a higher personality to a foreman whom he knows to be unfair than he does to one concerning whom he has doubts. Of course, the highest respect goes to the supervisor who is fair and concerning whom the worker has no doubts because he has made his fairness evident.

2. *Exhibition of Ability to Direct and Promote the Job or Idea.*—Many foremen make the mistake

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of thinking that they are expected to do the job better than any workman. In the case of promoting safety, the safety director or foreman often feels that he must be at the center of things. The fact is that oftentimes there are others under his supervision who are just as capable and perhaps in a better position to promote the idea than the supervisor himself.

It may be difficult for a person who takes his responsibility seriously to remain in the background. Yet, it so happens that in many cases the promotion of safety through others is the most effective way. What difference does it make if we are in the center of the picture or not? The really important thing is that the purpose be accomplished. The supervisor, who must coordinate all the activities, can best accomplish his purpose in safety by delegating the responsibility for details to others. In many cases the chief enemy of a good working program of safety has been the overenthusiastic safety director, foreman, or safety leader, who made it appear that the program was *his* program.

On questioning the workers concerning this point, it was evident from their answers that they attributed more personality to the supervisors who could stand in the background and direct the work through others, than they did to those who assumed the center of the picture. They indicated that in the case of the supervisor who always seemed to be in the foreground, the program was too much his and not enough theirs. One man said, "When the boss

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is out in front all the time, it looks like he toots his own horn lest it be not tooted. He wants to be the big shot. Why should we follow him?"

Thus, more personality is attributed to the supervisor who can ably direct, than to the one who tries to do it all himself. He is better liked if he gets others to attend to what he is promoting. Their interest follows their attention. They feel that they have a part in a program that concerns them. They like the supervisors who make them feel that way.

3. *Emotional Habits.*—It is on the basis of the emotional habits exhibited by the supervisor that he often has his personality named by those he supervises. They call him a "grouch," a "sour puss," the "bull," "rain in the face," and many other names. Or they call him "Mr. Jones" or "Bill" or they say he is a good fellow.

One very interesting example was cited by a workman. The foreman of his department was not well liked, "had a bad personality," because he got angry almost every day. When there just did not seem to be a thing at which he could be angry, he found something. The men did their best most of the time to provide something in the way of fuel for the fire of his temper. Things did not go very well in the department. The costs were high and so was the accident rate, although there was nothing beyond minor injuries and two lost-time accidents in the three years during which he had been foreman. Among the men he was called "the old sour puss" and "sad apple."

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One day he became very angry at a workman for some reason unknown to the man. After listening to the tirade for some minutes, the worker said, "I don't know what it's all about, but I guess it's all right."

The foreman retorted, "Let that be a lesson to you."

"O.K., S.P."

The foreman started away and then, coming back quickly, said, "My initials are J.W. Why did you call me S.P.?"

"Sour puss to you," said the workman, "and let that be a lesson to you." No, the man was not fired. The foreman took the lesson seriously and called his men together, asked them what they thought of him, and if they would help him change. His "stock went up" at once. The men began to like him. He corrected his emotional habits somewhat and now it would be hard to find a department in which there is a better record for efficient and safe production.

This little incident brings out the fact that people expect their leaders to refrain from overemotional-ity. They expect them to "keep an even keel" as one workman put it. They do not respect supervisors who lose their tempers too easily. On the other hand, they do not respect supervisors who are nervous, afraid, melancholy, or who go off and cry when the going is difficult.

The personality of the supervisor suffers if he is at either extreme of the range as far as emotional habits are concerned. For, although workers do not

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respect the person who loses his temper too easily or the one who breaks down in defeat too readily, neither do they attribute a highly acceptable personality to any supervisor who cannot show righteous indignation or who cannot shed a tear of human sympathy when he is sure the occasion calls for it. Of course, it is probably true that the most normal people as far as emotions are concerned are the ones who do show strong reactions under great stress, but they keep those actions proportional to the occasion and always within control.

The supervisor who is maladjusted emotionally cannot expect to be highly successful in the promotion of safety. He is responsible for promoting safety. His ability to promote safety depends so much on his personality, and his personality in turn depends in part on his emotional habits. Therefore, the safety leader must train himself in acceptable emotional habits if he wishes to promote safe conditions and develop safety-mindedness in those he leads.

4. *Speech*.—This trait more than any of the others is generalized. By this we mean that if certain methods and principles are followed in speaking, usually any group and almost every individual will attribute a highly acceptable personality to the person speaking, providing his other characteristic habits are not in the extreme.

We may inquire then, what are the essential factors in speech if we desire to be credited with a good personality? There may be many factors

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such as pitch of voice, tone, inflection, gesture, enunciation, pronunciation, knowledge of material, acquaintance with the audience, use of proper words, and perhaps many more. However, there seem to be four factors that are most important from the viewpoint of the people who attribute personality to others on the trait of speech.

1. Knowledge of material. Does he know what he is talking about?

2. Sincerity. Does he believe what he is saying and act as if he expected others to do the same?

3. Diction. Does he use meaningful words in the correct place, clearly enunciated, and correctly pronounced?

4. Contact. Does he speak *with*, and not *to* or *at*, those whom he wishes to influence?

All of these are important. The person who wishes to promote safety must know his subject, must sincerely believe in it as he tells it to others, must use dignified language which they can understand, and must speak *with* those whom he wishes to persuade. To be sure, many people do all these things better than others. Therefore, it behooves all of us to attempt to better ourselves in the mechanics of our speaking, the freedom and enthusiastic sincerity of our purpose in speaking, as well as in the increased knowledge of interesting and informational subject matter.

The one outstanding idea expressed by the workers concerning speech and personality was that they liked supervisors who spoke *with* them. Whether

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one is in conversation with one or two other individuals or is speaking to several hundred people in a formal audience, there are three ways of speaking: namely, *at*, *to*, or *with*, the person or audience. Only the last way is effective in attaining the attribute of personality or in attaining the purpose for which the speaking is done.

To speak with another person or group, the speaker must have contact with them in three ways. First, he must look at them, not stare at them. With one individual, that is easy enough; with many individuals, it is just as easy. He need not look at every person in his audience, but he must have eye contact with some of them in every area of his audience and the others will assume that they would also be individually included if the audience were not so large. Some supervisors are afraid of this eye contact. They are afraid they will be frightened. The fact is that the individuals with whom you speak will not "bite" you. They try to be helpful if they feel you are really interested in them, even to the point of wishing you well in promoting your ideas grandly, even when they are definitely antagonistic to the idea. On the other hand, without such contact, the listeners often become antagonistic to an idea with which they would otherwise agree. What is worse, they also quite often become antagonistic to the speaker or, still worse, sit politely but passively, being neither informed nor persuaded to action except to attribute a poor personality to the speaker.

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Secondly, the speaker must prepare his subject matter in such a way that it fits into the background of the experiences of his listeners. The speaker must know his audience and must fit his material to them; then, step by step, he may lead them to any idea that fits into the background as he enlarges it and gives it new direction.

There is plenty of common background in this idea of safety. Keep contact with the specific things people already know, and you have contact with them. Then present good material to enlarge the scope of that background, and they will be interested. Not only will your personality be regarded more highly and thus your leadership be followed more enthusiastically, but also the material you present will be instructive and will incite the listeners to positive action.

The third factor in speaking *with* workmen is that the supervisor must always understand what mental pictures they are forming from the words and actions he uses. This requires close observation of those with whom he speaks. The supervisor can tell by the reactions of the workers what they wish to answer and what they wish to ask if he knows them well. Those answers must be verified or diverted into proper channels and the questions anticipated and answered by the supervisor as he proceeds or contact is lost and he is no longer speaking *with* his men. If but a few people are involved, the answers and questions may be in the form of an interesting conversation. If the audience includes the whole

department, there may be no actual words from the men, but the supervisor must still know what would be said, and speak to his listeners as if in interesting conversation. One may speak *with* other people even if they do not say a word aloud.

You must speak *with* your listeners if you expect good results. If you do not speak effectively, you do not promote your idea or your personality. Safety is an idea that should be promoted. It deserves effective speaking. Your personality should also be promoted if for no other reason than that you get a better following as a leader in this whole idea of safe living.

5. *Dress and Appearance.*—Other things being equal, the supervisor who is appropriate in his dress and personal appearance is attributed more personality than the one who is careless in these matters. There is a definite range, however, concerning the dress of a supervisor in an industrial situation, and a gradation within that range for various levels of supervision and the types of jobs supervised. Clothes do not make the man, but they definitely seem to help. A foreman cannot come to work in his top hat and tails, if he has them. He would be laughed off the job. On the other hand, he is usually a more acceptable foreman if he wears a second-best pair of trousers than if he wears overalls or the usual attire of the workers in his department. He must shave regularly and keep his hair trimmed and combed.

The following incident is attributed to Charles

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M. Schwab and one of his young foremen. The young man had recently been promoted to foremanship and was still wearing his overalls. Schwab came through the plant one day and asked him how things were going. The young man replied, "Not so well."

"Go home and put on a suit of clothes," was Schwab's remark.

The young man turned to his duties only to hear the rather stern command, "Go home and put on a suit of clothes now! Remember, you are no longer an employee here until you do. Don't you know it takes a pair of trousers to make a foreman? The workers expect it. Give them what they want."

After these many years that man answers, when asked if he believes it helped, "I know it did, and now that I have in addition this fine head of white hair, there just isn't much my men won't do for me if I am sensible otherwise."

How much of his attributed personality and of his fine following is due to the dress and appearance of a supervisor, and how much to the being sensible otherwise, is rather difficult to say. However, foremen and workers alike believe that dress and appearance of the supervisor have much to do with his personality. On the other hand, the workers expect a supervisor to get into old clothes and get his hands dirty when the occasion demands. The frequency of such occasions seems to depend pretty much on the level or title of the supervisor, being less often for those of higher rank and almost daily for those of

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the level of subforemen and assistant foremen and gang leaders.

How much of increased following is due to the added respect by workmen, because of better appearance of the neat-appearing supervisor, and how much is due to his own increased confidence because of the added feeling of confidence neat appearance gives him is difficult to say. In either case, the men follow better, whether it is because they attribute more personality to the supervisor, or that he leads better because he has a new grip on life.

As concerns intellectual, physical, and moral habits, our study shows two things of importance concerning each of them. First, the people being supervised do know what the habits of their supervisors are concerning these traits. Second, there is a very definite range in which each of these must be exhibited in order that a desirable personality be attributed. None of them should be so high that the individual in the group could not attain to the same position by a little effort and sacrifice. On the other hand, the lower limit for each of them for the supervisor is approximately at the level of the central tendency in these traits for the group which he supervises.

The supervisor cannot be too "high brow" in his intellectual habits; what he reads and talks about. Likewise, he cannot read only "blood and thunder," and keep the respect of his workers, some of whom never get above that level. He must be able to talk of the current topics of the day as they appear in the

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newspapers which the worker reads. He will probably have to be up on his knowledge of sports. He may have to be interested in art, astronomy, music, or poetry for the sake of the occasional worker who is interested in these things. It is advisable to have some speaking knowledge of the field of interest of each workman. The job of being a leader is no easy one.

In his moral habits a supervisor must not be looked upon as being a "goody-goody." On the other hand, the "rounder" or the one who swears profusely is not highly respected for long by his men, even though they themselves are at fault in these respects.

In physical habits, the supervisor must keep himself fit and in good health to be respected. A workman may have many colds in a season, but his supervisor loses personality very rapidly if he has one or if he seems to be physically tired much of the time. There is an exception to this in the case of the very old supervisor who has been in charge of the same group of men for many years. In this case he is often more highly respected if he shows signs of physical decline, probably because he is honored for having given all he has had in the service of his job.

Other things being equal, the man of small physical stature must work harder on other traits than the large man to be attributed as much personality. However, if he does play up all other traits very well, without strutting or boasting, he has an advantage, because he is then noted for being such a

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powerful man when one would hardly expect it of one his size.

In the case of women supervisors, the larger women seem to be at a disadvantage if they have men under their supervision, as is sometimes the case in offices. However, they do not seem to be at a disadvantage when viewed by other women. Women view with special disfavor small men in supervision and often say that they have no personality.

We have viewed at some length eight traits on which personality may be attributed. It is well to remember that there are others which each can find for himself. The important thing is that some means of getting an acceptable personality attributed to the supervisor by the particular individuals or group he supervises is necessary if he expects to promote his ideas and be a leader. If it is safety you are selling or promoting, you can best sell or promote it by selling yourself first. Know your group, what they expect of you, and on what basis they will attribute a highly acceptable personality to you. Work on those factors and then present safety sincerely and enthusiastically to those who accept and follow you.

The Personality of the Worker. —The foreman who does not like or respect a man because he attributes negative or poor personality to him will not be likely to put forth the proper effort to sell him the ideas of safe and efficient action. Since the supervisor is directly responsible for the effective pro-

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motion of safety, he bears one of two responsibilities toward the man under his supervision to whom he attributes a poor personality.

The first duty of the supervisor in this regard is to be sure that he knows the man thoroughly and sees him in every detail of his characteristic traits with an unbiased and unprejudiced eye. Quite often, if and when he studies his men carefully, he finds that their personalities change in his view as he gets to know them better.

The second responsibility which the supervisor bears is made evident if, after close study, he finds that he still cannot attribute good personality to the man. Then he as a supervisor is responsible for the job of reeducating the man so that he fits properly into the picture. If he cannot do so, one of two things ought to follow. He ought to get rid of the man from his group, or he ought to get another job for himself; for he is not likely to try to promote or to be able to promote either efficiency or safety for an individual whom he dislikes, disrespects, or disregards. Of course, he may yet find a way to like the man, if he tries diligently enough.

The Foreman Is in the Strategic Position.—The supervisor concerning whom most of this book has been written, as far as industrial safety is concerned, is the foreman. Foremen, superintendents, safety directors, and other higher ranking supervisors must recognize at all times that this whole idea of efficiency and safety is one of close personal relationship between the workers and those supervisors who

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to them represent the company. Most of the time those men are the foremen. They are the only supervisors near enough to the rank and file of workers to have any marked influence upon them. Safety promotion is the foreman's job. Let him do it! Help him do it!

Safety directors often say they know that foremen should do the real safety selling, but that foremen are not interested and that safety cannot be sold to the foremen. That safety is not sold to the foremen is often true because higher supervisors do so little to sell either safety or themselves. They too often try to promote safety as their own big prize. Why should the foreman be interested? Foremen are men. They attribute acceptable or unacceptable personality to their supervisors and follow them or fail to follow, accept their ideas or fail to accept them, in about the proportion to which they accept the personality of their supervisors. The safety director must sell himself to the foreman in order to sell him the idea of safety, and then help the foreman to sell himself to the men in order that they will accept his leadership and ideas. That is the only way safety ever has been, and ever will continue to be, promoted successfully.

Any supervisor must get his own personality accepted before he can teach safety to the men he supervises. This is true in any level of supervision under any type of management organization, or in any field or activity of life.

Let no foreman save face for failure to prevent

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accidents or to promote safety by accusing the top management of inability or error. As foreman, you are responsible for the safety of your men whether or not top management or staff assistants aid you or hinder you. The foreman sells himself to his men by showing an interest in them personally, in what affects them generally, and in their specific problems. He sells his ideas of safety and promotes safe practice to those who have accepted him as their leader, by showing a special interest in the personal safety of every individual in his group.

Further, the foreman sells himself and his safety program to those above him, as well as to his workmen, by his genuine personal interest in the safety program and in safe and efficient activity, and by his careful attention to safe practice where he is personally concerned. He cannot promote or teach safety effectively if he does not practice it all the time. The supervisor must effectively sell himself to management and his men, to promote the type of safety program that will result in accident prevention and safe practice.

CHAPTER IV

ACCIDENT CAUSES AND SYMPTOMS

Causes of Accidents.—An accident that has occurred is only the symptom of some underlying cause. The result of an accident is not nearly so important as the unsafe practice which may continue to bring more of the same results. The causes of accidents may be divided into two general groups: physical, and supervisory or human.

The physical causes listed by the majority of safety engineers are not especially within the scope of this discussion, but will be touched upon briefly.

Physical Hazards.—Physical hazards are the conditions that may exist in a poorly organized or improperly planned situation, owing to error or lack of knowledge on the part of those responsible. A few examples may be of interest. In a factory in New Jersey many people were injured by falling down stairs. The stairs were clean, guard and hand rails were in place, the stairway was properly lighted, and employees had been warned. There continued to be accidents. One day, in measuring the width of the steps to compare them with another flight, it was found that the first step below the landing was two inches wider than all the rest below

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it. If one looked carefully at the first step, trouble was likely to follow, for muscular adjustments were made to its particular width which were of no value on the next step. The person lost balance on the next step and fell.

A similar case existed in the Midget Village at the 1933-1934 Chicago World's Fair. The stairs to the auditorium in the village were built to scale with the rest of the village and for the convenience of the tiny people. Normal-sized people could best climb them by walking sideways. But that is not the habit in stair-climbing. There were many cases of people falling, both up and down, on these stairs; so many in fact that a guard was stationed at the bottom of the stairs to shout constant warning that these steps were both narrow and low and that careful attention should be given in using them.

A third example is that of accidents to women passengers alighting from streetcars. The safety engineer for the street railways of a certain city reports that a great many accidents occur to women who back out of a street car. Proper hand rails were provided but did not improve the condition. A study revealed that women approaching the front of the car grasped the handle or hand rail with the right hand across the front of the body. In this position it was necessary to back out of the car to retain the hold on the handle. In stepping down backward, many falls occurred. The reason suggested by the safety engineer for grasping with the right hand is that women usually carry their purses

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in their left hand. It may be easier to shift the position of the hand rails to the opposite side of the door than to change long-established habits. The position of the hand rail is a physical hazard under the condition.

The above cases are only a few, but they may suffice to demonstrate some types of physical hazards that exist.

Poor housekeeping is another physical cause of accidents in industry and at home. Aisles cluttered with materials, dirty stairways, oily floors, and objects out of place have been contributing factors in many accidents. The clean, well-ordered plant presents less in the way of physical hazards than the poorly kept one. It is the responsibility of every supervisor to be a good housekeeper on the job.

In the 1939 National Safety Council Report, 20 per cent of industrial accidents are listed as due to stumbling and falling. Part of these may be avoided by removing the physical causes. Most of these physical causes could be removed by good housekeeping.

Defective equipment is a contributing factor in many accident situations. Although it may be true that machines do not chase men around to tear them limb from limb, it is, nevertheless, true that the unsafe man with an unsafe tool or machine is more dangerous to himself and his fellow workers than the same man with tools and machines in good condition. Defective tools and machines are involved in approximately 18 per cent of the accidents in

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industry. Man is unsafe enough at best. We ought not to encourage unsafe practices by means of unsafe equipment.

Unsafe Buildings Are Hazards.—Many industrial plants as well as dwellings and public buildings are fire traps. Each year they take heavy toll in life and injury. Besides the hazard of fire, there are falling walls and defective roofs to be considered.

Improper working conditions include such things as benches of improper height, dampness, dust, smoke, acid fumes, and other conditions that add to the discomfort of workers and that are conducive to illness and accidents. Often our own houses offer more improper working conditions than are found in industry, but this provides no excuse for such conditions in industry.

Improper planning of work makes for unsafe conditions. Raw materials and finished products that are not moved regularly tend to clutter up working space and make conditions more hazardous. Improper planning often results in slack periods of production, followed by times demanding increased speed of production. Under the pressure of speeding up, some individuals attempt to produce beyond their ability to work safely.

Improper dress and apparel may contribute to unsafe conditions. Certain jobs demand the use of rubber aprons, special gloves, hard hats, or safety shoes. After a man was injured by a falling rivet in the construction of the San Francisco-Oakland Bay bridge, the construction company had little

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trouble in getting the employees on the job to wear hard hats. Yet on most construction jobs such hats have, in former years, been the exception rather than the rule.

Loose and frayed clothing is dangerous where men come in contact with moving machines. A man whose work required that he bend over a slowly revolving shaft came to work one morning attired in a new jacket. He was proud of his new jacket and did not heed the warning of others to wear it inside his overalls if he must wear it. During the course of the morning, the loose ends of the jacket caught on the rough surface of the shaft and slowly but surely, the garment was wound about the shaft before it could be stopped. In this case the man by sheer strength calmly braced himself and permitted his new triple sewed jacket to be torn from his body. A man more excitable or less strong would have been severely injured, or perhaps killed, before the machine could have been stopped.

Certain types of clothing are prescribed for definite jobs. On the other hand, almost any type of clothing is all right on some jobs. On all occasions, the clothing should be conducive to safe performance of the job.

Temperature, ventilation, and lighting have recently come in for much attention as accident factors in industry.

Men working in temperatures too high or too low are not likely to work so carefully and safely as those working under more favorable conditions.

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Low temperatures must be guarded against by excessive clothing, making the worker unsafe. If he does not wear enough clothes to keep warm, he is in danger not only of working unsafely but also of contracting illness which will take him off the job or make him less efficient. High temperatures on the other hand are fatiguing and annoying. Because of discomfort, the worker gives too little attention to safe practices in performing his task.

Proper ventilation is necessary for safe working conditions. The air should be free from foreign particles such as smoke, fumes, and dust. The recent attention to silicosis and other respiratory difficulties in industry makes one the more aware of the dangers of improper ventilation.

Humidity is another factor that should be controlled. Men work more safely and with less feeling of fatigue and monotony in well-ventilated shops, where humidity, drafts, and temperature are properly controlled, than in places not so well adjusted.

Lighting as a safety factor is receiving much attention. Many shops and homes are still too poorly lighted to be safe places in which to work and live. Attention must be given not only to adequate light but also to the avoidance of glare and shadows. In a discussion before the fifth annual Philadelphia Regional Safety Conference, September, 1938, the point was brought out that by proper use of light and paints, the parts of machines could be highlighted in a manner to reduce accident possibility.

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All the above factors are important from the viewpoint of the safety engineer. The list is not complete. Any safety engineer could add many other physical causes of accidents, both general and specific. The above factors have been offered only as types of causes that fall within the classification of physical causes.

Supervisory or Human Causes.—There is a human side to this whole business of accidents, safety, and safety teaching. A better understanding of human behavior may help to uncover and correct the causes of many of the accidents that now occur.

If the responsibility for the physical factors just listed can be charged to the management duties of industrial leaders, the second group may be charged to the supervisory aspects of the job of those responsible for the conduct of others.

The supervisor is responsible not only for the material and physical aspects of activity but also for the human beings who handle the material and operate the machines. Every supervisor is responsible for the welfare of the human beings working under him, not only by social pressure but also by pressure of cost accounting departments of his own organization. In dealing with the human element in relation to his job, the supervisor should have a better understanding of human nature and human behavior than is usually the case.

A study of the human element in accidents reveals

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that there are several reasons why men have accidents; reasons for which all social groups in a supervisory capacity are responsible. They are listed briefly below and will be considered in greater detail in the following pages.

- I. Faulty instruction.
 - 1. Lack of instruction.
 - 2. Incomplete instruction.
 - 3. Erroneous instruction.
 - 4. Instruction not enforced.
- II. Lack of ability of those being instructed.
 - 1. Lack of knowledge.
 - 2. Lack of intelligence.
 - 3. Lack of aptitude.
- III. Poor discipline.
 - 1. Infraction of rules.
 - 2. Interference by others.
- IV. Faulty attention and attitudes.
 - 1. Attention distracted.
 - 2. Interest not sustained.
 - 3. Improper attitudes.
 - 4. Low morale.
- V. Unsafe practices.
 - 1. Haste.
 - 2. Short cuts.
 - 3. Chance taking.
 - 4. Showing off.
 - 5. Bad work habits.
- VI. Emotionally unfit.
 - 1. Apathetic.

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2. Excitable.
3. Maladjusted.
 - a. Fears.
 - b. Worries.
 - c. Insanity, etc.

VII. Physically unfit.

1. Defective.
2. Fatigued.
3. Weak.
4. Ill.

In some of the foregoing factors the supervisor bears a responsibility akin to guilt and blame if he neglects properly to train and handle his men. In others he is responsible only to the extent that he should discover the condition and do all he can to have the individual correctly placed at his task or removed from it, if his defects cannot be adjusted to make him safe. These supervisory factors will be the basis for the greater part of the discussion to follow.

Causes More Important Than Results.—In considering the accident as a symptom, it is evident that the attention should be focused on the cause more than on the result. Attention to the causes will reveal the prevailing conditions that are conducive to accidents. This includes not only the physical conditions but also the human factors that enter into the situation. A study of results merely makes one aware of the number and severity of accidents; a study of the causes reveals the underly-

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ing factors contributing to the accident and to the possibility of similar situations in the future.

A doctor may be interested in a fever, as such. However, his chief interest is in the underlying condition of infection from which it results. He may reduce the suffering but is usually not satisfied until he has removed the source of the difficulty and brought the whole organism back into that state of well-balanced functioning in which fevers do not prevail. The fever to him is the symptom of some temporary condition that must be corrected, or of a malignant and permanent condition that will disable or eventually destroy the organism. In much the same way, the accident should be considered, not as the sum total of the situation but as a symptom of some underlying condition that must be corrected if the organization is to continue without impairment of the working force or social group, through personal injury or loss of life.

Study the Near Accidents.—The study of causes makes possible the prevention of further accidents. Such a study demands that attention be given not only to fatalities but also to so-called minor accidents or slight personal injury cases, and to situations causing no injury to human beings. These latter are often called "near accidents." A distinction should be made, however, between an actual accident in which there is no personal injury, and those situations which result neither in loss of time nor in injury but which are potential accident situations.

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For every serious injury there are approximately twenty-nine minor injuries and approximately 300 accidents causing no personal injury. The number of near accidents for every actual accident, fatal or otherwise in its extent, is somewhere near fifty. From these figures one should become aware that there is far more territory for study of accident causes than that presented by the actual occurrence of situations resulting in injury or death.

Oftentimes it is easier to get an impartial interpretation from those in a position to observe in the case of a near or minor accident than in the case of a serious or fatal accident. At such times excitement runs high, men are often prejudiced and biased in their opinions, and an account true to facts is difficult to obtain.

Another point of importance is that the causes in cases of near accidents can be discussed freely and safety teaching applied to the point; in the case of a serious accident or fatality men are often too excited to learn effectively, and supervisors may be reluctant to discuss the situation in all its details because of the embarrassment to those involved.

Some people who are involved in serious accidents love to talk about them. Such people are likely to discolor the facts for the sake of making heroes of themselves or others, or on the other hand to belittle the other fellow, or even to "knock" those in positions of authority.

Others refuse to talk in case of serious accidents. They may do this to avoid blame being placed upon

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themselves, to protect a friend or companion, or in some cases because they would rather forget the incident. Many such individuals are afraid of similar situations occurring to themselves, and out of fear refuse to discuss an accident. Furthermore, many men who are involved in accidents have been led to believe that they are dumb or foolhardy and will not discuss the accident, lest it might reveal these accusations to be true.

In this last regard, those in authority have often been at fault. Many supervisors, enforcement officers, and parents have labored hard in their safety teaching to belittle the person who has an accident by calling him unpleasant names, picturing him as being half-witted, and by various other methods making him an undesirable person in the social group. In one industrial plant, the plant magazine was used extensively for this purpose. The *Safety News*, as it was called, from time to time ran a picture of Ozzie in bandages. If you took one look at Ozzie, you knew he wasn't quite all that a man should be. You immediately thought of him as being a good-natured, half-witted blunderer. This was further impressed upon you by the printed material portraying his conversation. All of this is amusing enough to an outsider, to the supervisor, and even to an individual workman who is not injured. But what of the man who is injured for any one of many reasons?

One day a man whose hand was cut, while at work, and duly treated and bandaged, called at the

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office for the plant paper. He paged through it and stopped at the picture of Ozzie, looked at his own bandaged hand, turned, and quickly walked away. Anyone observing could scarcely fail to notice the expression on his face as he looked at that picture. Something like this was probably his subvocal utterance, "So they think I'm like Ozzie, do they?" Men who are thus chagrined can scarcely be expected to talk freely of accident causes especially when they are involved.

Even under the most carefully controlled conditions it is more difficult to get an honest and enlightening report of an accident involving personal injury or individual blame than is the case in the near-accident situations. However, if the supervisor takes the proper attitude toward the man involved, he may discuss freely and frankly all situations involved in any accident.

Study of Human Behavior Necessary.—In all accidents and near accidents, the supervisor will do well to search into the facts of human behavior. In practically all cases, man is involved, sometimes as the cause, sometimes as the victim, and quite often in both ways. Not only is it necessary to know human behavior to understand more fully the causes of accidents, but certainly it is true that safe practices cannot be taught effectively if the teacher does not know the nature of those who are to learn.

Under no condition is a supervisor in industry to be excused for not knowing the materials and machines being used and the hazards in their use.

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Industry places squarely upon every foreman the responsibility for knowing and avoiding hazards in his department. He, it is assumed, knows safety, knows safe and unsafe practices, and knows what to teach his men. Of course the assumption is wrong in many cases. Many foremen do not know the hazards of their departments, do not know what safe practices are, and furthermore, do not know what to teach and what not to teach in training their men in safe practice on the job. If you go into almost any plant for the purpose of investigating safety training, you will be amazed at the lack of knowledge concerning the physical causes of accidents not only on the part of workmen but on the part of foremen, and often on the part of the safety director or engineer himself. What is true in industry is even more evident in other areas of life, such as the school and the home. In many plants the superintendent in charge of safety still believes his big duty to be the recording of accidents that have happened. In addition he may hold safety meetings in which he compares departmental records and admonishes the supervisory force, sometimes effectively, sometimes not, to put up posters and keep their record clean.

The old "white elephant" for the department with the lost-time accident takes so much of the director's time that he has no time to get at causes and develop methods of teaching safe practice on the job. Too much time is given to the effect or result and the recording thereof and too little to

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the cause and the correction of it. Here again industry is probably in a better state than the general public as concerns safety.

In meetings of safety conferences it is amazing, if not annoying, to note the lack of emphasis on cause, and the great stress upon keeping records and providing compensation and meeting or beating the laws on the subject of accidents. This is true of too many who attend such conferences. On the other hand, it is rather encouraging to note the stress placed, by some of the leaders of such conferences, upon the investigation of causes of all types of accidents, and the proper approach to the "getting across" of safety to the man on the job, in the home, and on the highway.

In spite of the fact that those interested in promoting safety should know the physical side of safety, they quite often do not; more discouraging than that is the fact that they know so little, and often seem to care less, about the nature of the human being who is in most cases the major contributing factor in any accident situation. Several years ago, the National Safety Council published six pamphlets entitled "The Human Side of Safety."¹ In them the author points out that men must be understood and that a good personal relationship must exist between the worker and his supervisor if any kind of safety training is going to be effective.

A high-school teacher once replied when a school

¹ ROSENSTEIN, L., "The Human Side of Safety," National Safety Council, 20 N. Wacker Drive, Chicago, 1936.

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supervisor asked him what he taught, "I don't know unless it is boys and girls." At first the supervisor was irritated for he desired to know what subject the teacher was responsible for; but later he recommended that all teachers under his supervision be teachers of boys and girls first, and of subject matter afterwards. Perhaps we should remember that one does not teach safety, but that one teaches human beings how to act safely. The chief point of interest is, however, that one must know human beings to be able to teach them, and must know the human elements that are contributing factors to unsafe situations before he can remove those factors as causes.

Responsibility for Safety-mindedness.—The supervisor must be aware of his responsibility for making those whom he supervises safety-minded. Even though he knows the causes of accidents, even the human elements involved, so that he can list them all to his followers, he has not, therefore, of necessity reached the stage of getting them to think and act safely in their activities, to avoid hazards resulting in accidents, or to desire to learn the means of so doing. A study of the causes which so involve the total behavior of the worker will soon bring the supervisor to the point where he will recognize the necessity for knowing how the human being behaves, what may be predicted concerning that behavior, how to adjust him to his conditions of activity, and what is necessary to develop in him an attitude of safe living. All this will reveal to the

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leader that besides the responsibility, placed so squarely upon him, for knowing physical causes of accidents and how to eliminate them, he has the even more difficult responsibility of knowing the forces and factors of human behavior that play such a large part in determining whether a man or woman will be safe or unsafe in their activities; and whether or not the unsafe individual can be trained in attitude and action to a condition of acceptable safety. In a study of causes, the supervisor will be made aware of his own responsibility for making those with whom he works safety-minded.

Men, the Unsafe Factor in Accident Situations.—Man is usually the unsafe factor in every accident situation. Machines do not maliciously devour men or even scratch them. An estimate for 1937-1938, as given at the fifth Annual Philadelphia Safety Conference, shows that machines or other known physical hazards were involved in only 15 per cent of the industrial accidents in the commonwealth of Pennsylvania. In practically all these cases, man was also involved as a causal factor. The other 85 per cent of accidents seem to be due to the human factors alone. As the speaker said, "If you chased all the machines of Pennsylvania industries across the Delaware River into New Jersey, you would still have to account for 85 per cent of the accidents which occurred in Pennsylvania in the last year."

The reports of various industries show the same ratio of approximately 15 per cent of accidents involving machines or tools, and 85 per cent not in-

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volving machines or tools as the chief factor. It appears, then, that an understanding of the nature and the behavior of human beings is vitally important in the reduction of accidents and in the teaching of safety.

What Determines Safety-mindedness?—If the leader is responsible for developing safety-mindedness, it might be well to see what determines it; what its elements are.

The safety director of a large corporation once said, "I can train my men in the causes of accidents, show them the seriousness of results, and tell them about safety; but I can't always get them to think and act safely. They just don't seem to be safety-minded." His whole attention was focused on the idea that one must understand the human being, if he expects to make him safety-minded. It was in response to the need that he saw so clearly, that the outline from which this book has been developed was first drawn up.

To make a man safety-minded is to direct his attitudes, arouse his interest, employ his abilities, and develop his habits, all along the line of safe practices on the job, in his leisure hours, at play, while driving his car, and at home. This dealing with attitudes, interests, abilities, and habits requires that one know considerable concerning the behavior of human beings. One must know how to use and control emotions, how to change habits, how to get and hold attention, what interest factors are, and a great deal about correcting maladjustments of be-

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havior. Further, one must know much concerning the practical relationship of personality to the whole problem of development of high interest, proper attitudes, good morale, and proper performance.

The study of the causes of accidents reveals that such a knowledge is imperative if safety training is to be successful. The adjustment of total behavior of the human being is the basis of safety training, which not only makes the person aware of hazards and correct practices, but develops in him the type of thinking and acting, attitude and interest, motivation and morale, and ability and habit, that puts him in the class of the safety-minded.

The accident, or unsafe situation, is usually a symptom of some underlying cause involving a poor adjustment of the human element in the situation. The study of these causes throws upon those interested in safety promotion the responsibility of dealing with human beings as they are. To tell men to be careful, to avoid hazards, to keep out of accidents, to think safety, and to act safely is futile. To say that men are unsafe because they are human is not enough. One must know what the nature of the human is. Knowing that, one must know how it can be changed or adapted to the situation, or if it can. Wherein the human element cannot be adapted, the situation must be altered to fit, in so far as possible, the human factors. To make adaptations of the human element, one must understand the nature of that which he is trying to adapt.

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When and if the attitudes, interests, abilities, and habits of an individual are so adjusted and adapted to the situations of life that he thinks and acts safely, he may be said to be safety-minded. The job of so training, adjusting, and adapting human beings is a job that requires an interested and capable leadership. The day of the hard-boiled boss and loud-swearing driver of men is past. The supervisor of today in the home, in the community, or in industry, whether he be in charge of production or of safety promotion—and the two should not be considered as unrelated and separate—must be a leader of men.

Accidents Can Be Reduced by Good Leadership.—Accidents can be reduced and safety promoted by good leadership, leadership that is aware of the human factors, as well as the physical factors, causing accidents; leadership that is effective in building a good personal relationship between itself and the follower; leadership that is effective in arousing and sustaining the interest of individuals in efficient and safe activity.

Leadership Aware of Human Factors.—A man was killed in a steel mill. Bars of steel fell from an overhead crane to the floor, landing on end. As they fanned out and toppled to the floor several of them struck the man on the chest as he leaned back to get out of the way. He was severely injured and was taken to the hospital where he died three days later of pneumonia.

These facts of the man's injury and death are

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interesting enough, but the whole case becomes more interesting when we learn that a foreman in another plant of the corporation, in discussion with the author, predicted the workman's death two weeks before it happened. The man had worked for him for many years previous to his transfer to the plant in which he was fatally injured. In making this prediction, that the man would be involved in an accident, it was pointed out that he was of low intelligence, slow in movement, agreeable, capable of heavy work requiring little in the way of speed, superstitious, and emotionally immature. It was suggested that unless his new foreman knew his qualities as a human being and so placed the man where hazards were few, no good end could come of his transfer. It was further suggested that the man needed sympathetic and understanding leadership; "bossing" and "preaching" merely served to confuse him. When the transfer was made, the foreman told the supervisor in the other plant these things concerning the man, but he was made aware of the new foreman's opinion that he knew how to handle men.

The old foreman, who was invited to sit in on the hearing when the case was investigated, made a very significant remark later. With tears in his eyes and in a regretful tone, he said, "My God! if we were only leaders who understood these boys instead of bosses who are so damn sure of ourselves, that fellow might be with us yet."

Perhaps it was an unavoidable accident as the

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records state, but the investigation revealed more than physical causes involved. It revealed the importance of the human factor to those who are interested. It also revealed the importance of an enlightened leadership, capable and willing to understand the human elements involved in such situations. However, pitifully enough the results of the investigation revealed that all the members of the investigating board, save one, were willing to close the case by reprimanding a workman who should have known how to secure the load better and the craneman who failed to clear the victim by a greater margin.

That these men were due for reprimand may be true, since rules and regulations are set up for them to follow. However, no thought was given as to why they did not know or did not do the safe thing. It was just an unavoidable accident that the foreman shouldn't let happen again or some one would lose his job. It may be that vindictive punishment, or even revenge based on results, is still a more prevalent idea of the proper method of reducing accidents than the idea of the study of causes and the elimination of the same by enlightened leaders who understand their men as well as their machines.

Good Personal Relationship.—One whom you distrust or dislike cannot get you to accept or believe his ideas. This may be true even if the ideas are good. The workman who distrusts his foreman, the child who distrusts his parents or his school teacher, does not pay much attention to the ap-

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pointed leader's instruction concerning safe practices. A workman was put on a job on a new scrap bailer in a certain tin-plate mill. The details of construction were still in the process of adjustment but the new machine was in operation. There was an iron beam above the place where Tony worked. The foreman told him to be careful lest he strike his head in the process of straightening up while scooping the scrap into the pit. It was a bad place in which to work, but with proper care it was possible to work safely until the position of the beam could be changed in a few days. The man struck his head on the beam, laying his scalp open and knocking himself unconscious. In the hospital the safety director asked him, "How did it happen?"

"It just did; no can tell; new job."

"But you were told to watch for the beam and to work so that you wouldn't injure yourself when your foreman sent you on the job."

"Yes, I know, but I no like boss so I say, 'what the hell.' I no listen. He all time make me mad. He got it in for me. Bang, I catch it on the head—maybe boss was right, but most time I no like him, too damn smart."

There is just one saving fact in this situation. Tony did open up and reveal the source of the difficulty; however, not until after he had been hurt. He did not like his foreman and he was not interested even in his good advice. Of course Tony may have been chiefly to blame for the bad personal relationship; but the foreman did not meet his re-

sponsibility in discovering and dispelling the difficulty.

If it is difficult for leaders, because of poor personal relationship, to teach safety to their men on jobs where the specific hazards are pointed out, it is even more difficult for a leader who is disliked or not trusted to build up the more general attitudes and interest in safety which must function if safety-mindedness is to be developed and safe practice is to become the one right way in all activity. Only when the leader has gained the confidence and trust of his followers through good human relations is he in a position to have his safety teaching, be it ever so good, accepted as an integrated part of the behavior of those he is instructing. Then, and then only, will he be successful in the reduction of accidents, because he has been able to deal with their most important cause. Such a leadership must be trained, not only in the fundamentals of human reactions but also in the fine art of adapting to and understanding human relations. The leader who would reduce accidents *must know himself* as a human being, as well as his fellow men, in order to establish a desirable type of personal relationship with those whom he attempts to instruct.

Arousing and Sustaining Interest in Safety.—The reduction of accidents through good leadership depends to no small degree upon the ability of the supervisor to arouse and sustain the interest of individual workers in safe activity. Interest will be more fully discussed in a later chapter. Suffice it

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to say here that it is one of the great responsibilities of a leader to develop a following interested in producing results by the safest possible methods.

The supervisor cannot meet this responsibility unless he knows the human being well enough to know what factors are involved in arousing his interest. If he does not know these factors, and therefore fails to develop interested followers, his success in reducing accidents will be very much hampered. He may perform his other duties of management ever so well, but, if he fails as a good leader in a supervisory capacity, he will arouse very little interest on the part of his followers in either efficient activity or safety.

CHAPTER V

HABITS IN RELATION TO SAFETY

We human beings are definitely creatures of habit. Most of us have been putting the same arm into our coat sleeve first, ever since we were children, and just now very few of us could tell whether we approach the task with the right arm or the left arm unless we try it. Yet we get our coats on quite smoothly. However, if requested to reverse the order we make a rather nasty mess out of that simple act. In our regular procedure we follow a pattern of action without being very much aware of what we do or how we do it. We have made habits of such things as putting on our coats. We put on our shoes, wind our watches, smoke our cigarettes, drive our automobiles, and even kiss our wives chiefly by habit. A definite pattern becomes established which assures us of a smooth performance on the level of activity adopted, even though that level may be criticized by others who are more analytical or who think they know correct performance.

Do we want things done by habit? Let us take the task of driving an automobile, as an example. What applies to this task applies to a high degree to most industrial tasks. Shall we drive our auto-

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mobiles by habit chiefly or by strict attention to every detail of performance? Perhaps the answer is evident when we observe one who is just beginning to learn to drive. With few exceptions, we would not be willing to send that person out onto the highways and into city traffic immediately after half an hour of instruction in driving, in which time we could possibly give him the list of details of what must be done.

If we drive our cars effectively, we do most of the driving by habit. The shifting of gears, the release of the clutch, the application of the brakes, the steering of the car in response to road conditions and traffic conditions, and many other activities are chiefly well-established habits or patterns of action of which the better drivers are scarcely aware.

Is, then, a driver to pay no attention to his driving? He had better do so if he knows what is good for his car, himself, and the public at large, and it is a pretty large public after all which becomes interested rather vitally in how we drive. There are two things that may be said about attention. First, attention must be given to the novel and unusual situations that so often confront the driver. But attention cannot be given to the novel and unusual unless first of all the ordinary activities are made so habitual that attention may be set free to be directed to the thing that is different or unusual as it arises. Then too, the unusual and therefore dangerous condition is rarely even recognized as such except by those who have already established a

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background of good habitual performance. The second thing to be said of attention is that even a method of directing one's own attention should be established as a habit. The good driver quite often asks himself the simple question, "What, on the basis of past experience, should I expect in the situation, and what is likely to be different?"

It is probably evident that we could not possibly drive our cars safely at the speed limit, even though that might be reduced by half the present figure as it stands in many states, if we had to attend to every detail of the driving. We must establish habit patterns in any performance if it is to be done on the level of effectiveness required in our civilization as it stands. We are not only creatures of habit because of our nature, but also because our very environment demands it. The chief question then seems to be not so much to the point of whether or not we will perform chiefly by habit, but rather as to how we shall establish good habits, and how we shall escape the well-established habits to meet the unusual situations.

Good and Bad Habits.—Biologically every habit has a right to exist. A habit as such is merely a pattern of activity and is within itself neither good nor bad. We arbitrarily judge it to be good when it promotes, and bad when it defeats or fails to promote what we have come to accept as desirable activity. Thus, since a habit is nothing other than a well-established response pattern to a stimulus situation, it is just as easy, or difficult, to form what we

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arbitrarily judge to be good habits as it is to form what are judged to be bad habits. The qualifications good and bad are on the basis of our judgment as we view the result, and are not an integral part of the habit at all. Therefore, if we say that we want men to work safely, we must at once face the problem that we have named safe activity as a good habit and unsafe activity as a bad habit, either one of which may be developed. Thus safe practices must be built as habits. The supervisor bears the responsibility of promoting good safety habits on the part of each workman in his department.

Safety Habits Are Learned.—Just what is the nature of a habit? We have said that it is a pattern of action or response to a stimulus situation. Further we may say, whenever a certain way of responding to a stimulus pattern has been fixed or established, so that a certain stimulus pattern is invariably followed by the same response, whether or not the one making the response is aware of it, a habit has been formed. This definition involves learning in the formation of the habitual response.

Habits of safety are learned. No man is by nature safe in his activity; likewise, no man is by nature unsafe in his activity. He just acts, and as he acts in a certain way as a response to a stimulus, he tends to fix that way. He has learned to act as he does *by acting as he does*. Some schools of thought would say that he has insight into a way of acting against the background of the scene set for him. In any case, if his way of acting becomes

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relatively fixed, he has learned. Thus, if the activity he performs is unsafe, he learns to act unsafely; if the scene is set for him to have insight into only the unsafe method of activity, he acts unsafely. On the other hand, if the scene is set so that he can see and repeat only the safe way of doing a thing, he learns the safe way as a habit. Again we must say, *Habits of safety are learned*. We have the responsibility of so setting the scene that only the safe way will be learned.

The safe way in a specific task is not native. Only gross activity is native. The channels into which it flows are cut by a learning process. We all know that in the case of two equally active workmen, one may respond with comparatively safe activity and the other with comparatively unsafe activity, to the same job. This is probably because of the fact that one has had his activity properly directed into channels of performance, until a regular pattern, which we call a "habit," has been established, which results in safe practice. The activity of the other has been improperly directed into channels, until unsafe habits have been formed and unsafe practices result. They both perform by the kind of habits they have learned; the one safely, the other unsafely, and someone did a good job with the one, and a poor job with the other as far as habit development is concerned.

If we start with a child who is normally active, we find that all adjustments to specific practices such as a job must be learned. This is true of the

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acts of skill required on the job. It is also true of his attitudes. Furthermore it is true of his practices as regards safety. We all know that a man must learn to perform on a machine in a given way, even to the extent of making his performance a smooth habit, if he is to be efficient as far as production is concerned. Let us now remember that we are not only interested in efficient production but in *effective* production. Effective production not only is the best method as far as quantity and quality are concerned, but also includes safety. The safe way is the best way. Thus, while training a man in the acts of skill to the point of habit, we must see to it that the skillful acts are safe acts and then we will have developed a performer who is habitually effective; for he will be not only efficient but also safe.

Whenever we respond repeatedly by means of a definite pattern of action to a stimulating situation which has been superimposed on man's environment, we act by habit. Most of the activities in which the people in whose safety we are interested find themselves are just such superimposed situations. Their actions must be so guided that the habits resulting from the often-repeated actions are respectable when we view them after they have become fixed as habits. To us these habits are and can be respectable only when we can say they are safe habits.

Some People Are Safe by Habit.—It is quite evident to us, as we observe workers in industry, that

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some of them proceed at their jobs with habits of safe activity, and others proceed with habits of unsafe activity. Perhaps we should make ourselves responsible for finding out how those who have safe habits learned them. If it is possible to do this, it may also be possible so to set the scene and to train others that they will develop the same type of habits.

It is not enough just to note that some men have habits of following safe practice and that others do not. It must be further noted that those who do not have habits of safe practice do actually have habits of unsafe practice. In both cases they got to be the way they are. They learned something; namely, their way of acting. It became fixed, became a habit. A way must be found to develop the correct habits, if victims or creatures of habit we be.

How Are Habits Formed?—This leads to a discussion of how habits are formed and how they may be changed. If the responsibilities already pointed out are taken seriously, it is necessary to know how habits are formed if the scene is to be set for proper habits; and how they may be changed, if those in effect are not desirable. Someone has said that habits are easy to form but hard to change. Yet it must be assumed that if a habit can be formed or learned, it may also be dismissed or broken or a new one substituted in its place. It would be well to remember at this point that so long as there is a stimulating situation present, some kind of response will be made. A stimulus must be satisfied; that is,

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some response adequate to remove the stimulus is demanded. If the stimulus is recurrent, the response will also be recurrent. This does not mean that there may not be many different, adequate responses varying in a wide range for many of the stimulus situations that arise. Thus, the answer "No!" to the request for a loan of money may remove the stimulus as well as the answer "Yes," when your would-be friends think they need help. Likewise one man learns to operate a machine safely, the other unsafely in response to the same general stimulus pattern. If either the safe or the unsafe response pattern becomes fixed, we call it a "habit."

A response is linked to a stimulus. There are some response patterns such as heart action and breathing which are much the same in all men. On the other hand, language habits, whether you speak German, French, Chinese, or English, are artificial responses to the stimuli that demand vocalization as a response, even though they may seem quite natural when we consider that the French child can satisfy the other stimuli of language situations only by responding in French to his French-speaking parents. Suppose, though, that the French baby is adopted by the Eigelkrauts of Berlin, then he might be expected to say "Heil, Führer" in very acceptable style and we would be surprised if he suddenly shouted "Vive la France." Thus it may be seen that almost any response can be linked to a stimulus, but that the stimulus, usually being made up

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of a rather ramified pattern, tends to get a best fitting response.

In safety work, then, it is evident that the "French babies must be adopted into German homes if we expect them to behave like Germans." Stating it more directly, the proper stimulus pattern in all its details, besides the mere central stimulus to run the machine, must be presented if a man is to be expected to make the correct response; and the pattern must be repeated often enough to fix the response, if the correct way is to become a habit. If the proper or correct way—here the safe way—does not become a habit, some other way, namely the unsafe way, is likely to become fixed; then the man has developed an unsafe habit of operating his machine.

Many Responses Possible to a Stimulus.—It is true that many responses may be conditioned to any stimulus, if the natural responses that maintain the biological organism be excepted. However, when that has been said, one must be aware that perhaps only the most apparent part of a total possible stimulus pattern has been viewed as the stimulus. Thus a worker is told to wear his goggles and the telling seems to be the stimulus. Some workers respond to that stimulus by putting on the goggles even to the point of making it a habit. But you also know that some workers respond by violent language when they are told the same things. In either case the response may become a habit. The first you call a good, the second a bad habit. You

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think they were both made as responses to the same stimulus. You may be mistaken. Although the thing you viewed as the stimulus (your suggestion or command to wear goggles) may have been the same in both cases, it is just possible that the whole stimulus pattern was not the same in both cases. One worker liked you, or saw why you gave the order even if he didn't like you or the order. The other worker disliked you, or didn't see the reasons why he should follow it even if he liked you. If the good habit is to be established (in this case the wearing of the goggles), it may be necessary to bring into play details that will result in stimulation that does get the correct response often enough to fix it as a habit. Other details may be brought into the stimulus pattern which will more naturally get the response desired, such as your use of goggles, the explanation of reasons for using them, the presenting of a picture that is more understandable to the man, and, perhaps not least, the establishment of a good personal relationship with the man so he cannot "let you down." If for any reason the workman does what you want him to do and continues to respond until it becomes a habit that will be aroused by any part of the pattern you present, you have accomplished your purpose. It may then be possible, when the habit is established and conditioned to the recurrent and ever-present parts of the stimulus pattern, to discontinue the special details used to get the response in the first place. But until the habit is formed, try every method you know to pro-

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vide a stimulus pattern that will demand safe practice as the response.

A group of men in an open-hearth department were observed for half a day. They removed and put on their goggles many times, apparently by habit. Only once in the entire period did one man fail to put on his goggles. He stood by seemingly distracted by something while the rest of the crew proceeded to the task. The foreman in the department looked at the boy, held up his own goggles, pointed to them, and put them on. The result made it seem to the observer as if some act of magic had been performed. The boy was no longer in a quandary. He put on his goggles and went to work. Evidently something had disrupted the pattern of his activity, his goggles were not in place, and being a part of his habitual response he could not proceed until all parts of the regular habit could be carried out.

When asked if it had always been like that concerning this particular safety measure, the foreman answered with a wry grin, "No, not always. They all had to learn it, and it took something just a little different in the way of approach for each man, especially that boy who seems to have the *goggle habit* so bad that he couldn't work if he didn't find them on his nose; but now all that can be left out most of the time, and building back wall just means goggles even before you pick up a shovel."

Like that foreman we will find it necessary to weave much into the stimulus pattern for different

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individuals to get safe responses. Like him we may find that, if the responses recur often enough, they will become conditioned as habits to the often recurring parts of the pattern, so that the special approaches may be discontinued from the pattern of stimulation when once the response to the recurring part of the pattern has become conditioned and fixed as a habit.

It might be well to interject here what has been said on a previous occasion, that those of us especially interested in promoting safety may learn much from those who really have to put our safety programs into effect; and furthermore that no matter what our level of title or dignity of position or enthusiasm for the cause may be, finally the real job of developing safe habits of work rests squarely as a responsibility upon the immediate supervisor. In an industrial organization that person, as far as the worker is concerned, is his foreman who is to him in all his many unguarded moments not only his boss or leader, but the very company itself.

Reforming and Changing Habits.—Habits can be changed. This requires one or the other of two techniques. It is possible to substitute a different stimulus which gets the desired response. It is possible to substitute a different response for the same stimulus. The latter method is the one usually followed, since it is rather difficult to remove the stimulus in most industrial situations involving the use of certain modes of procedure without which the activity involved could not continue. Of course, we

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might make safe automobile drivers by removing the automobiles! Likewise, we could avoid having men killed by crane operators who swing loads over the heads of workers by eliminating cranes, so that there would be no stimulus for the operators to swing loads at all. The point is that the regularly adopted procedures of life present certain stimuli to us, and will continue to do so as long as the procedure of life remains as it is. Thus some of the stimuli are difficult to remove or be replaced by a substitute that contains none of the essential elements of the present stimulus. Since this is true most habits must then be reformed by the adoption of different responses to the existing conditions. One may respond to punch presses by putting his hand on the die, or he may respond to the same press by keeping his hand where it belongs. The punch-press part of the stimulus pattern will not be removed. The individual must find a way to make the safe response to it. Some way must be devised to get the safe response rather than the unsafe one to the stimulus situation which of necessity remains pretty much the same in most industrial jobs.

We are confronted then, if we wish to change habits, with the problem of how to get men to act more safely than they now act, even if nothing in the way of equipment and prescribed work methods is changed. It is a problem, for example, of how to get a crane operator, who has a crane to operate and loads of bar steel to move, to so operate the

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crane as he carries the loads that men's lives are not endangered; or of getting the craneman into the habit of never bumping another crane except under special orders to do so, when it has been the habit of some of the operators to bump other cranes even against the well-stated safety rules of a plant.

Sometimes it seems to take a dead oiler to get the boys in the cabs to change their habits; but that is terribly hard on the safety record, it costs too much, it just is not humane, and furthermore we do not like it! There must be some other way to get crane operators into the habit of not bumping, rather than following the habit of bumping another crane just because it is there. If some way can be found that will make the man respond by refusing to bump the crane, except under special orders, and he follows that way of acting often enough he will have changed his habit.

What are some of the ways to get men to change their habits? One man says just tell them to change. This works in some cases. We ought to try it at least. Sometimes we expect men to see the evil results of their bad habits and make the change themselves. But we do not want these evil results to exist even though they may be of value as a means of teaching someone what not to do. Another suggestion is that we show the possibility of danger in the old habit and the probability of escape from it if a new type response is developed into a habit. This offers a new reason for the change and promotes it. An old habit cannot just be

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dropped. The plans must be well developed for a more suitable response which is able to satisfy more fully than the former habit, if it is to serve as a substitute for a habit well established. After all, the old way of doing a thing is easier than the new way when we first attempt it. We follow lines of least resistance. Before we can say very much more about suggested methods of changing habits, another factor must be noted.

Resistance to Change.—Most changes are resisted. This is true not only of the changes of a larger nature in the socioeconomic order about us, but especially true where our individual habits are concerned. What is the nature of this resistance? Perhaps if we could find what the nature of our resistance to change is, we could also find ways to break it down and thereby rather easily change habits. Perhaps we do know what factors are involved in this resistance men show to the change of their habits; but at the outset of this discussion let us point out that those factors make it difficult to reduce resistance, and thus make any habit of long standing difficult to change. However, nothing will ever be gained by the assumption that habits cannot be changed. They can be, even though it is difficult and much careful attention is required on the part of the one directing the change. Old habits are rarely changed by command.

The factors involved in the resistance to the change of a habit are as deep-seated as the very physiological nature of man. Biologically every

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organism, including man, tends to conserve its energy. The habit that is well established involves the use of definite nerve-muscle and nerve-gland reactions. When a new response is required, it means that the ready-made channel is more open and the flow of activity will pass through it rather than take a new course unless the new course is made easier than the old or the old one sufficiently blocked to make further activity in it impossible.

Attention is required to do the thing in a new way. Attention means tensions of muscles formerly not required in the old pattern. Thus any change means that more energy must be expended to make the new response rather than the old. It may be true that after the new response is formed and developed to the point of habit, it will require less energy than the old habit and get better results. However, in the immediate situation, more effort is required until the new way is learned than is required to perform along the lines of the old habit.

By giving a long-range view of the old habit and its results and of the possible new habit and its results, it is sometimes possible to show that the new method by comparison will be less energy-consuming than the old habit, even if the first effort is considered. Even in this case the immediate expenditure of energy is greater for the new response than the old, until it has been fixed as a habit. Therefore, it may be necessary to show a rather long-range and complete picture which will be sure to

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absorb or compensate for the effort used when the change is first made.

Emotional Resentment.—There is another factor which is probably more powerful in the determination of resistance to change than the one just named. It is the factor of emotional resentment. Men tend to resent the situation that interferes with their habits, and either passively or actively to resent the individual by whom they believe the change is being promoted. This emotional resentment arises out of the fact that when any well-established response to a stimulus is blocked and a new way must be found to satisfy the stimulus, the nerve energies diffuse rather widely through the body and cause an unbalanced or upset condition until a new way of satisfying the stimulus is found.

When a man is in the state of an emotion, he tries to find the quickest and surest way out. That way is likely to be along the lines of well-established habits. If they in turn are blocked, he finds any other way out and acts rather unintelligently or violently in so doing. In that case he not only resists the change but becomes the more likely to promote the old unsafe habits. If he develops new habits, they are likely to be positively bad. Men under the stress of emotion are usually not very effective in acts of skill, speed, and fine adjustment and are often positively dangerous. Old habits will never be changed if the man is brought to the point of emotional resentment in his natural resistance to a change. He must be given reasons for the change

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and then taken through the change at a rate that will not promote a high degree of emotional anxiety.

As an example of resistance to change involving emotional resentment, we may take the simple situation of asking a man to change his well-established method of putting on his coat. A foreman in a supervisory training class was called to the front of the room and asked which arm he put into the coat sleeve first. He did not know, but proceeded on request by very smooth activity to remove and put on his coat. He did this several times always in the same way. He was timed. Then he was requested to reverse his method. He made a rather rough job of it. The time used was twice as long as the habitual method. Under careful guidance he made the effort to substitute a new response for the old habit, but put on the coat in the old way when he was told he might return to his seat. As a result of this he was recalled and told to do it the new way and to hurry it up because he was not efficient enough. When he got tangled up in the coat, he was laughed at and called a dummy, then harshly commanded to do it the way he was told. The result was amazing. The man crumpled his coat and was about to throw it on the floor. He was ordered to put it on as he had been told. To this he answered with an oath, adding, "Try it yourself. I'll put it on my way; but before I do, I think I'll sock you on the nose." He came close to fitting his actions to his words. He was taken back to his seat breathing heavily, heart beating rapidly, and face

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flushed. It took him twenty minutes to calm down enough to talk intelligently about the experiment. That man was a supervisor. He admitted that he had been using the same methods to get habits changed in his men and that he had had considerable trouble accomplishing his purpose.

However, a man may be led to change the habit of putting on a coat, of operating a machine, or of handling a tool if approached correctly. Never must the situation be forced for any individual so rapidly that he resents the change because he has become emotional. There are three steps to the procedure of changing a habit.

Three Steps in Overcoming Resistance to Change of Habit.—The first step is to block the old response effectively. This requires more than a command in most cases. It requires that the old way be shown, against the background of a complete and long-range picture of the situation, as being ineffective and undesirable.

The second step must follow upon the first at once, and must have been planned carefully in detail before the first step is taken. This step is the substitution of a more attractive response to be developed into a habit which will, when viewed against the long-range and complete background, be more attractive and desirable than the old one.

The third step is to establish a high personal regard for the leader so that habits of reaction to him and his suggestions will help to block the habits of unsafe practice. This step should be taken before

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either of the other two is planned. If there exist a high personal regard and esteem of a man for his leader, he follows him even in the change of habits that require great effort on his part because he just cannot let his leader down.

All of this requires a well-planned approach which moves only as fast as the individual can take it. In the hands of the leader are the tools that determine the setting of the scene for speeding up the change. The personal relationship which is established as a regular order of events determines the ability of the supervisor to make changes rapidly or slowly.

CHAPTER VI

INFORMING NEW MEN

We all might do well to consider the problem of lack of knowledge in relation to accidents not only in the major fields, such as industry and traffic, but also in our own homes where so many accidents occur. Every school should increase knowledge in accident prevention; it is as important as many of the other useful things now being taught in our schools. Certainly the foreman must inform new men concerning hazards and safe practices.

The Puzzled Mind.—This term “the puzzled mind” may be applied to the individual who is projected into a task without adequate training or equipment to meet his requirements. The three factors chiefly responsible for this confusion of mind are mental limitations, language difficulties, and lack of experience or knowledge.

A rather bright young man—now a foreman—left his job in a coal mine and went to work in a steel mill. At the employment office he was given a pass and told to report to Mr. Brown, foreman in the open-hearth department. His own description of what happened is enlightening.

“Without too much trouble I found the O.H. de-

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partment and Mr. Brown. He was a kindly looking gentleman who smiled readily; and I thought at once, I shall like him. I told him I was the new man who had come to work in his department. He said, 'Fine, I need a good slagger. We are ready to tap a heat in two minutes and forty seconds. Go right over to number nine and help the boys.' Up to this point everything was serene and quiet except for a brute of a machine pushing iron into a furnace at the other end of the department.

"Then the order came to tap the heat. I didn't do much but watch the first one. All hell seemed to be breaking loose. Everywhere I moved I was in somebody's way. I tried to dodge the sparks of hot metal. I wished I were back in the coal mine where it was cool and quiet. At last the heat was tapped.

"Next we relined the furnace. That was a hot job and I got my face pretty badly scorched. I didn't seem to get away from the door like the other men, and every shovel of material went in the wrong place; the foreman told me so.

"After that we had a few minutes to sit down. It was then that I really got dizzy. Everything seemed to be in a whirl. I couldn't remember where I was. Everything around me seemed unreal. I thought I had died and this was the eternal reward. No description of hell ever pictured anything worse than I was experiencing.

"All that first day seemed like a dream. That night I couldn't sleep. In several days I learned

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some of the tricks of the job and got more used to things. Now I am all right. You see, I was puzzled and confused.

"Now that I am foreman of this department, never will I let another man go through what I went through that first day. A little bit of careful informing will do a lot to help the new man on the job. It was just lucky I didn't get killed. I won't have any man working for me put to the hazards of that first week without every bit of information I can give him."

What this foreman experienced when he came on the job as a third helper many years ago is what has happened to many a man whose instructions consisted of nothing more than, "Go to work over there on number C-23." It is not at all unnatural to become confused when knowledge or experience is lacking and the situation is new and unusual.

The Man Who Doesn't Know Is Dangerous.—Not only does the lack of knowledge mean that a man will be confused and puzzled, but this confusion of mind makes him subject to accidents. Not every new man on the job has the feeling of confusion just described. Even though a man may feel at comparative ease, he is still dangerous if he does not know the hazards of the job or how to do it in the correct way.

Lack of Experience Correlates with Accidents.—A study of accident causes and prevention over a ten-year period in the iron and steel industry indi-

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cates the relationship of inexperience to accident rates. "Wherever it has been possible to isolate groups of relatively inexperienced men it constantly appears that accident rates are in some degree proportional to the lack of experience on the part of the worker. Whenever the new-man accession rate is high, accident rates will rise, and a decline nearly always sets in whenever the accession rate begins to decline. Extreme inexperience is particularly likely to show high accident rates. Whenever business depression comes on, the less desirable man will be the first to go. The result will be a force of relatively greater experience and of more reliable character. This influence must be quite important in the lowered accident rate of periods of depression."¹

Two studies summarized on page 294 in the *American Labor Legislative Review*, September, 1924, are indicative of the relationship between lack of information and accidents on the part of new men. Data obtained from the records of two large mining companies, show that 48.1 per cent of the injuries occurred during the first two months of employment, and that 20.5 per cent occurred during the first week.

The second study involving the relation between labor turnover and industrial accidents shows that,

¹ CHANEY, S. W., "Causes and Prevention of Accidents in the Iron and Steel Industry, 1910-1919," p. 9. Government Printing Office, Washington, 1922.

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in 1921, accidents occurred among all employees with a ratio of one to every four; whereas, they occurred among new employees with a ratio of one to each one hired.

Industry should recognize the fact that the new man should be informed and that special supervision must be given to him because he is unfamiliar with the conditions.

One large steel mill reported the following statistics ¹ (1938-1939):

Length of service	Number of employees	Number of lost-time accidents	Rate per 100 employees
1-30 days.....	43	6	13.95
30 days-1 year.....	468	39	8.33
1-5 years.....	3,585	40	1.12
6-10 years.....	2,316	31	1.34
11-25 years.....	2,657	64	2.41
26-34 years.....	326	10	3.07
Total	9,395	190	2.02

There were seventy-two crafts and occupations involved in these figures. Six of the injuries were to foremen. There seems to be an indication that the older employees increase in accident rate over those with the one to ten years' service. Other factors such as declining ability, increasing age, and declining health may be functioning in these cases.

¹ Records made available to the author by the plant safety director.

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However, these factors are not effective in the case of the new employees most of whom were young men; here the rate was very high. The new employee is subject to accident chiefly because he is new and inexperienced, because he lacks knowledge.

The statistics from one division of a utility corporation show a similar trend, over a period of twenty years:

Length of service	Number of employees	Number of lost-time accidents	Rate per 100 employees
Less than 1 year.....	26	103	396.15
1-5 years	199	102	51.25
6-10 years	95	34	35.77
11-15 years	75	18	24.00
16-20 years	35	7	20.00
21-25 years	23	4	17.40
26-30 years	16	3	18.75
31-35 years	15	5	33.33
36-40 years	7	2	18.57
41-45 years	1	1	100.00
Total	492	279	56.71

There were 185 of the total number of employees involved in the 279 accidents. These figures, again, show that the worker with the least service and experience tends to have accidents more frequently than the employee with a longer period of service and greater amount of experience.

A study of the accident frequency in relation to length of service made by the safety director of a

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large manufacturing plant¹ for the year 1938 shows the same trend as the other studies reported.

LENGTH OF SERVICE-ACCIDENT FREQUENCY, 1938

Length of service based on date last employed. Salaried employees not included in this report

Length of service	Number of employees on roll	Actual number of accidents	Rate per 100 employees
Less than 6 months.....	61	3	4.92
6 months-1 year.....	252	6	2.38
1-2 years.....	913	15	1.64
2-5 years.....	1,264	12	0.96
5-10 years.....	677	18	2.66
10-20 years.....	2,943	28	0.95
20 years and over.....	1,916	24	1.25
Totals.....	8,026	106	1.32

In this study, as in the others, the frequency is highest among those of least service and tends to rise again in the group with very long service. It is noted that the group with five to ten years' service showed a rise in frequency. No explanation was available for this peculiar fact. The group was made up of the comparatively small number of men hired during the depression period from 1929 to 1934. The safety director suggests that there may have been some relationship between the haphazard selection used and the type of men hired at that

¹ Records made available to the author by the plant safety department.

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time which would account for the greater tendency toward accidents among them. (The personnel department had been greatly curtailed during the depression.)

On the other hand, the men with less than five years of experience were carefully selected. There seems to be evidence then from this study that the new man is more likely to have an accident than the one of longer service.

All the studies reported show the same trend. They all indicate that the man who is inexperienced and uninformed is at a disadvantage; that the man who does not know is dangerous; that the new man must be trained carefully.

Lack of Knowledge Leads to Accidents.—The individual who is new at a task in any area of activity cannot know just how it should be done unless he is told and shown the proper procedure. Owing to this lack of knowledge it is likely that he will take unnecessary risks. He is anxious to make good. He wants to prove himself. He will work hard even if he is doing the wrong thing. The harder he works in the wrong way, the more dangerous he is to himself and others.

There are so many new things for the new man to learn in the first period of his employment that he cannot keep his attention on any of them very long. J. J. Matthews, in an unpublished article, lists twenty-five things the new man needs to know in addition to the skills and standards of the job. They are as follows:

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1. Rate of pay—standard and overtime.
2. Place, time, and method of pay.
3. Opportunity for advance in pay loans, etc.
4. Working hours.
5. Opportunity for promotion.
6. Location of entrances and exits.
7. Location of drinking fountain.
8. Location of washroom, lockers, and toilets.
9. Names of supervisors and fellow workers.
10. Plant geography.
11. Recreational opportunities.
12. Educational facilities.
13. Department policies and standards.
14. Methods of adjusting grievances and complaints.
15. Grounds for discharge or discipline.
16. Company pension plan.
17. Plant signaling system.
18. Toolroom procedure and method.
19. Plant policing.
20. Location of cafeterias.
21. Personnel department—location and procedure.
22. Publicity bulletins, newspaper, etc.
23. Safety rules and enforcement policies.
24. Nature and location of safety equipment.
25. Medical service—hospital, doctors, nurses, etc.

With all these things besides the actual learning of the correct and skillful procedure on his specific job, he is somewhat confused. Placed at a disadvantage and distracted, possibly confused and fear-

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ful, he sometimes presses to please and make an impression. Under these circumstances the new man is very likely to be injured.

The new man should be carefully informed concerning the things he should know. Some foremen keep a check list of what the new man should know and what he will want to know. In the first few days they cover this list in discussion with the new man.

If the new man on the job is properly introduced, carefully instructed, and patiently trained, he is not apt to take unnecessary risks. It is the opinion of most of 920 foremen questioned by the author on this point that the foreman is at fault when a new man takes unnecessary risks. The foreman knows, the new man does not; therefore it is the foreman's job to inform him.

Other workmen and especially the safety leaders can be very helpful at this point. Some supervisors maintain that the best way to keep the new man from showing off and taking chances is to introduce him to some of the other workers who will "show him the ropes." This gives him a feeling of belonging and he gets a certain amount of information from the worker's viewpoint which becomes invaluable knowledge to him; this is often difficult for the supervisor to give because of the theoretical, if not actual, barrier between the boss and the worker.

In one plant it is the general practice to have each new employee shown the method of procedure on his job and sponsored in other points he wishes

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to know by some member of the workers' safety committee. The employees of this plant have an unusually high interest in safety and a very good record in this respect. Furthermore, the accident rate for new employees of this company is not significantly greater than for those of longer service. Evidently the proper induction procedure there eliminates the hazard of accident due to inexperience and lack of knowledge.

Remember the New Man!—He has a dangerous state of mind; he may be bewildered, confused, frightened. He is anxious to please, and fights the very ball he should handle with ease; he wants information but is fearful of asking lest he be classed as dumb. He will take chances because he does not know what to do and how to do it, or what not to do. On the other hand, someone who knows can prevent all this by calmly, confidently, sympathetically, and patiently informing him.

The new man not only does not know the correct procedure, which causes him, in his anxiety to please, to take unnecessary risks, but he is also dangerous through ignorance of the hazards that surround him. He must be informed concerning them.

Men need not be told not to touch very hot iron or steel if it is glowing red. They have learned in childhood that the red glow is fair warning to keep away. Aluminum when poured into the molds is not red and glowing however; thus, a new man in the melting department of an aluminum manufacturing plant should be made aware of this difference

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in the metal so that he might avoid serious burns. This is just one specific instance. There are peculiar hazards to almost every job concerning which the new worker should be informed. Every supervisor should know these hazards and teach his men accordingly as soon as they come on the job.

Without the knowledge of what to do and how to proceed, the man who attacks a new job tends to follow old habits which quite often do not fit the new task. He can break these old, and possibly dangerous, habits only if he is properly informed. Habits are built on the basis of the knowledge and experience of the one who builds them. If the old habits are dangerous, new and safe habits can be built only if the individual is properly informed. The poorly informed worker is dangerous; the well-informed worker may be guided into the formation of safe habits of action.

Inform Men Concerning Safe Practices and Special Hazards.—Every individual on a new task should be informed as to the general rules of safe conduct. Too often it is taken for granted that people know these rules. It is not enough just to inform all the members of a group concerning safety rules. Each man, especially the new man, should be checked to see if the information really got across to him.

The new man is confused by a whole flood of new material to be learned. He may not in this confusion give sufficient attention to safety rules unless the supervisor calls his direct attention to

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them, having first isolated them from the great jumble that seems to attack the new man.

In addition to the general safety rules, each man should be informed concerning the specific hazards of his job. This should include the peculiarities of the working place as well as the unusual factors of the job itself.

Each supervisor should know the specific hazards and the safe practices for each job in his department. He should inform every worker in his department concerning the hazards, the methods of guarding against them, and the safe procedures in doing the job. For instance, if the job involves heavy lifting, the worker should be shown the correct method of doing this to avoid back injury or hernia.

Besides the specific details on each job it is well for the supervisor to inform the new man on certain general principles. The following list may serve as a guide or check list for the supervisor on points concerning which he should inform the new man:

1. The new man should be informed on ways to keep physically fit on the job. He should be informed as to the necessity of reporting any illness or physical defect to his foreman at once.

2. Information of methods of reporting accident and injury should be given. Necessity for reporting the slightest scratch should be stressed. Many people do not know the dangers of infection in industrial injury cases. One out of every twelve lost-

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time compensation cases in industry is an infection case.

3. Inform each worker how to do his job according to the prescribed method. Tell him that the prescribed method calls for the use of rubber insulation grips on the pliers he is to use in doing the job. Show him how to bend the legs at the knees, how to keep the back straight, how to grasp the object, and then how to let the leg muscles do the work as he rises when lifting heavy objects.

4. Inform him concerning the danger of unwarranted hurry. Inform him that he is expected to walk rather than run.

5. Inform him concerning safe operating speeds and safe feeding of his machine.

6. Inform as to reasons why guards are installed on machines. Show him how they work and how they protect him.

7. Inform him that everything must be in readiness and everybody safely stationed before he starts a machine. Show the proper starting and stopping methods.

8. Inform him that machines must be stopped for repairs.

9. Inform him as to what constitutes proper housekeeping in his work place.

10. Inform him concerning the rules against "horseplay" and the penalties for engaging in it.

11. Inform him against throwing objects about the shop or at other employees.

12. Inform him on the proper use of gas, air, hy-

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draulic, and electrical equipment. Teach him to avoid using the compressed air hose for dusting clothing or hair or for cleaning his bench or working place.

13. Inform him on the necessity for using tools that are properly dressed and in good condition. Inform him as to the correct tools to use for each job. Show him how to use the tools.

14. Inform him concerning the use of goggles, safety shoes, hard hats, and other bodyguards necessary for the safety of the worker on his specific job.

15. Inform him as to his duties and responsibilities in regard to reporting hazardous conditions and unsafe practices.

16. Inform him concerning all plant and departmental safety rules and the penalties for infraction of the rules.

Every supervisor can enlarge this list as concerns the details of safe practices in his own department. Although the list is one that refers chiefly to the supervisor's task of properly inducting the new man on his job, it is evident that it will serve also as a guide for checking on the information that every worker should receive from his supervisor.

Methods of Informing the New Man.—How shall the new man be informed concerning specific safe practices and general safety rules? When shall he be informed? By whom shall he be informed? There have been many answers to these questions. It is doubtful if there is any one best way of im-

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parting safety information. The important point to impress upon every supervisor is that the new man must be informed. If the proper information has not been given before he reaches the foreman, the responsibility for determining that fact still rests on the foreman. There are, however, ways in which the foreman can be helped in discharging this duty.

In many industrial organizations the new man is given a handbook by the personnel department when he is hired. It should include, along with statements of policy and practices of the company, the safety rules that the new worker is expected to follow. If the handbook is carefully written and printed in good form, it provides an excellent source of information which the worker can review when he leaves the job after the confusion of the first day.

Let no supervisor make the error of assuming that because the new man has received a handbook including the safety rules, there is nothing left for him to do. He must give the man not only all the information in the handbook, but also more specific details concerning practices and hazards in his own department. He should also assume the duty of encouraging the worker to study the handbook in his leisure time, the better to fix the rules concerning which he has been informed by the supervisor.

At best the handbook can serve only as a ready-made notebook to which the student worker can refer after he has been taught. But, as such, it is

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very important. If well prepared, it is valuable; if properly presented, it will be read.

After the new man has been informed in general plant safety rules and organization policies and practices by the personnel department, he should be introduced to his new foreman. If there is a general view of the activities of the entire plant before he is introduced to the foreman, the man is usually less confused when he enters the department in which he works.

Many foremen make a serious mistake after this introduction. They fail to introduce the new man properly to the other workers and to induct him into his new job properly. The new man who is properly introduced will usually find some worker who will sponsor him and inform him on safe and efficient methods. If he is not properly introduced by the foreman, there is a tendency on the part of other workers to let him learn the hard way and to laugh at him if and when he gets into trouble. Some foremen use the method of designating an experienced worker to act as a sponsor for the new man. When this is carefully planned and personalities are carefully considered, it usually proves a very effective means of informing the new man on many of the details of safe practice on the job. It presupposes careful training by the supervisor in safe practices of the worker who is designated as a sponsor. There is no great value in having the blind lead the blind.

Plant and departmental bulletin boards are some-

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times used to present safety rules and information to new and experienced workers alike. Some means must then be used of assuring the reading of this material.

Several methods have been used in checking on the reading of handbooks, bulletin board material, and other safety information. One department store has successfully used the safety question session. In this organization the new employees are called together near the end of each day for two weeks. Under an enthusiastic leader they are asked questions most of which can be answered only if they have studied the informational material given them in the form of handbooks and bulletin board notices. Such sessions are valuable only if they are made interesting and lively. If they become deadly, dragging, time-consuming periods of annoyance, more harm than good will result.

A better method for most supervisors to follow is that of checking with the new worker individually on the various items listed in the handbook or bulletin board. This should not be a session in which the worker is either patronized or belittled. The foreman not only has the right to check on the worker's information concerning safety; he has the responsibility and the duty to do so. The new worker expects this and will respect the foreman if he does it in a straightforward manner.

Every supervisor would do well to provide himself with a check list of the things on which he should inform the new man. Many of these items,

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and perhaps most of them, must be covered on the first day. This does not mean that they will be fixed in the mind of the confused new worker and remembered. Therefore the supervisor should, over the period of the first several days or weeks, take up each item in review with the new worker at convenient times to assure himself that the new worker is truly informed. The check list will help him to avoid "harping" on the same thing over and over again and help him to avoid missing important items.

The particular method used by a supervisor or a company must be determined by the individuals involved. One method may be good in some cases and almost worthless under other circumstances and conditions. The method used is not nearly so important as is the fact that some method is planned and used to inform the new man.

CHAPTER VII

ATTENTION, INTEREST, AND ATTITUDE

How often have we heard someone who is responsible for the safety program say, "They are not interested in safety."

Of course, that is not true; all men are interested in their own personal safety. However, they may not be interested in the particular methods used to promote it.

The safety director of a large industrial plant accused the master mechanic of not being interested in safety. The curt reply was, "Not in your kind of safety." The argument was under way and after much "'tis, 'tain't" it ended where it began. The master mechanic would not cooperate with the safety director in certain projects but challenged him to show a department with a better safety record than the machine shop. It was not true that the master mechanic was not interested in safety. On the other hand, he would not cooperate very extensively in promoting it by certain means.

Arguments do no good in such cases. There are better ways of arousing the interest of such people as the master mechanic in question. The safety director appealed to the personnel director for help.

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The personnel director pointed out that the master mechanic was vitally interested in advancing a certain young workman to a position of importance. Here was an *interest factor* for the master mechanic. There were no openings in the department at the time. It was suggested that the young man who was an enthusiastic worker and qualified in many ways for leadership be appointed chairman of the workers' safety committee. This was done. Now the master mechanic is enthusiastic over the promotion of safety and subscribes to the program heartily. It is even a little amusing to hear him tell the safety director what a fine program he is carrying out for the plant. A way was found to gain his interest, not in safety as such for he already had that, but in a specific safety program.

The chief problem is not how to get attention, arouse interest, or develop attitudes; but how to direct attention to specific things, how to guide interest into certain channels, and how to form the desired attitudes. All normal human beings attend to something. All of them are interested in something and all of them have attitudes. How, then, can that attention be pointed to the things we wish them to learn and become interested in, and how can the proper attitudes be formed?

It might be well to point out that the whole problem is the reverse of the conception so popularly held. It is often assumed that people have attitudes on the basis of which their interest is aroused

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and that they attend to the things in which they are interested.

A much better working hypothesis reverses this popular conception. Under this hypothesis we would say that men pay attention to things that have attention-getting value greater than other things about them at a given moment. They become interested in the things to which they attend. Having formed a definite channel of interest, they symbolize that interest and it becomes crystallized into an attitude that is represented by the name or other symbol attached to the channel of interest. In most of our attempts to direct interests and attitudes we have attacked the problem as if the reverse were true. Let us now assume that the order is (1) attention, (2) interest, (3) attitude, and then attack the problem in a forward direction.

Attention.—The supervisor must gain the attention of his followers and keep it repeating along the lines of safety, if he wishes them to be interested in safety and to become safety-minded.

What, then, is this elusive thing—attention—of which we speak so freely? We have all heard school teachers, foremen, leaders, and advisers say, "Pay attention"; "Give attention"; "Your attention, please"; and "You'd better pay attention, or else!" Is it something we can give or pay? Is it something we can order from others? Probably it is not. It is rarely gained by command. When it is, it is only because the individual has formed a habit of letting the command words be his stimulus to attend.

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The Nature of Attention.—Attention has been variously described as a mental state and as a physical state. Probably the best description of it for our purpose is the very simple one: Attention = a tension. Now, not every tension of body can be classed as attention; but when the body tensions all have a common focal point of which the individual may be aware, he may usually be said to be attending to that point.

Observe a group of children on the scene of an accident, watching a doctor administer first aid to the victim. Their eyes are focused on the hands of the doctor as they move from his kit to the gash on the victim's head; their leg and back muscles are tense, their heads are cocked to one side. Some are bracing their arms to avoid being dislodged from vantage points by others; others practically climb on the backs of those in front to see. Every part of the body of each is tensed for the single purpose of focusing on the objects of activity. They are *paying* attention, or *giving* it, or *having* it; at least they are attentive.

What is more, they are learning something about that to which they attend. And, are they interested? Everyone will tell all about it at his family table when evening mealtime comes. Some of them would even like to see another accident happen, so keen has been their interest because so tense have they been in observing the things that happened.

The supervisor interested in safety can, if he uses the correct methods, direct the attention of his fol-

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lowers along the lines of safety, and thus help them to learn the attitudes and methods of practice that will promote safety. In the chapter on learning, it is pointed out that most people learn the things to which they attend and fail to learn anything else. The chief problem then in the promotion of any idea or practice that must be learned is so to set the scene that attention will be directed to the proper things.

Some Methods of Gaining Attention.—Attention is usually best gained by some objective means. Something must direct the tensions of the body toward the thing or idea which you wish to be the center of attention.

Novelty of presentation often is very effective in gaining attention. In presenting merchandise the advertising experts are constantly devising new ways to gain attention to their particular article or idea. They realize the value of novel presentation; of new and unusual ways of showing the same old article. These same advertisers are now applying scientific measures to the effectiveness of the methods that they use. Perhaps in safety it is also necessary to devise new and unusual methods of presentation to direct attention to the particular activity or idea that you desire others to follow or adopt.

Movement has a great deal of attention-getting value. The eye tends to follow moving objects. One of the recent developments in billboard advertising is the use of moving objects. The hundreds

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of flashing neon signs along the city streets are also evidence of the use of movement for the purpose of gaining attention.

Graphic means of presentation have been effective in directing attention. Here such devices as posters, diagrams, and films have been used to considerable advantage.

The safety film should present, on the positive side, situations of real importance to those who view it. The same is true of diagrams and posters. All these graphic devices should be simple enough to be understood and yet should present something of value to everyone in keeping with true-to-life situations. Of course, the cartoon type of diagram, poster, or film may be an exaggeration; but to serve its purpose, it must be readily transmuted into real life values in the mind of the one who sees it. Most of the graphic presentations of material have, if carefully developed, a great deal of attention-getting value. Perhaps the old Chinese saying, "One picture is better than ten thousand words," has value. Certainly there are some people who absorb an idea more readily and who attend to it more fully when it is presented in graphic form.

A superintendent of a department listened for two hours to a group of foremen tell him of a proposed improvement. They had made a careful and well-planned description but he did not seem to be interested in their proposal. In fact it was doubtful if he had attended closely enough even to know what it was about. He was distracted by other

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pressing matters. Finally one of the foremen, having lost his temper, took a piece of chalk and dashed a long line on the door of the office and said, "Does that mean anything to you?" It didn't, but the superintendent had begun to direct his attention to the line. The foreman told him that the line was meaningless, but that he would draw a diagram that would mean something. He proceeded to diagram crudely the proposed change and in ten minutes the superintendent gave his order to carry it out. Those foremen now say, "If you want the boss to give his attention, or if you want him to do anything, draw him a diagram." Perhaps graphic presentation eliminates the use of words that so easily shift meaning and thus cause attention to flow into other channels than the one desired, whereas graphic presentation provides for a constant return of attention to the channel presented. At any rate it has its value as an attention-getter in many situations. It can be used by the supervisor in calling attention to safety.

Demonstration is usually effective in directing attention, providing the demonstration is well planned and presented. A safety director found it difficult to direct the attention of the workers toward the gas hazards in the plant. He had spoken at safety meetings, bulletin boards had been used, letters had been sent to workmen, and every effort had been made to get the workers' attention to the problem of gas hazards and the methods of artificial respiration for victims. There were twenty-three

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cases of asphyxiation in a short period of time. This fact was made known; but still there was little interest in the problem and attention could not, seemingly, be attracted to it.

The safety director hit upon the idea that, if he could put on a good demonstration, he could attract attention to the problem. He borrowed some guinea pigs from a hospital laboratory and by permission of the interested societies he performed his demonstration. He had a glass case made in such a way that he could introduce carbon monoxide gas to asphyxiate the animal and then give it artificial respiration without removing it from the case. The whole demonstration was planned to be carried out in a very short time. He set up the device where workmen would see it. Then when a group gathered around he opened the valve from the CO tank and the guinea pig fell over. Next he exhausted the gas and by a special device, regulated by increasing and decreasing pressures, administered artificial respiration until the animal came back to normal. He got attention directed to the demonstration. Every man in the department came to see it performed and the men became very attentive to the problem of prevention of gas hazards and methods of artificial respiration. The proper means had been found to direct their attention and they are now extremely safety-minded concerning gas hazards. In this specific case, a well-planned demonstration was the means of directing the attention to a problem that formerly had been con-

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sistently ignored in spite of all the efforts to talk the men into attending to it.

Intense stimulation is sometimes necessary to attract attention to a given object or idea. Sharp or contrasting sounds gain attention in a place filled with general noise. Contrasting and vivid colors have more attention-getting value than the gray or dull colors with which we are so often surrounded. A bright yellow against a background of contrasting color or black has a rather high attention-getting value. Intense physical stimulation, such as a hard blow or a sharp prick, has a great deal of attention-getting value, but it usually causes so much resentment that it cannot be used when dealing with men in an every-day work situation. On no occasion should the intensity of the stimulus used be so great as to cause fear or anger or resentment or do harm to the person being stimulated. It may have attention-getting value but it usually directs the attention in the direction opposite to that which was planned. People will gather around a bright light suddenly turned on in a partially illuminated room; but if the light is too intense, they will shield their eyes against it and move away. In both cases their attention has been directed, but in the latter case it has been in such a manner that they move away from, rather than toward, the object that gained their attention.

Good use of examples of extensive scope and implications, yet specific to individuals, was made in one industrial plant. The safety director took mov-

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ing pictures of production processes in various departments. He excluded all men from the pictures, except for hands and feet as they were involved in the process. He included, interspersed with the pictures of processes, specific pictures of cases of poor housekeeping, accident hazards, and also samples of good housekeeping and correct and skillful procedure. He showed his film to the foremen of the plant. In no case could any individual be identified for they were not shown, but usually the foreman had a pretty good guess as to whose department the particular section of the picture belonged, because objects and machines could usually be identified. The result was astonishing. The safety director found on a trip through the plant three hours after the showing of the film that four hazardous situations had been properly adjusted. Only two of these showed in the film, but the other two were very similar in nature. These foremen had been shown specific examples from their own plant and enough of them so that each could say to himself, "One of those scenes definitely could refer to my department."

In dealing with one individual at a time, the problem is made more simple. However, it is still necessary to vary the examples used to direct his attention sufficiently to get the one which best elicits a response from him, and which is specific enough so that he attends to it closely enough to become actively engaged in doing something about

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the situation in his field of activity to which the example points.

A point of caution seems necessary. Some people in trying to direct the attention of others use examples so overdrawn that they lack verisimilitude. They are just too good to be true! Sometimes such *good* stories distract the attention from the point for which they are told and guide it into other channels. A speaker addressing a large group at a safety congress told such an emotion-rousing story to direct attention to a certain point he was trying to make, that the story itself became the focus of attention rather than the point he attempted to draw by the use of it. A man approached him after the meeting, grasped his hand, and with tears in his eyes congratulated him on his fine speech, saying that for half an hour after the story he had not been able to think of anything else, and that he wasn't sure that he had got the points of value as far as safety was concerned; but that it was "just an awfully good speech." This annoyed the speaker, so he questioned several men who had been in the audience concerning what he had tried to tell them. He found that none of those questioned had really learned anything he had tried to present to them. But they all remembered the story and thought the speech very good.

Many times in directing attention to safety, the same error is made because the examples and incidents used direct attention to the example, but not to the point at issue. One must be careful to make

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the point and to avoid misdirecting attention to things of no importance lest he be congratulated on a beautiful presentation of no value.

Frequent stimulation is useful in directing attention into specific channels. If a stimulus occurs often enough, though it be very weak at any one time, it usually prevails and attention is given to it. If you touch a sleeping person lightly on the cheek with an object such as a horsehair, he may move a little but does not wake up. However, if you repeat the stimulus once a minute over a period of several minutes, he is almost certain to waken and give definite attention to the problem of finding out what can be done about the situation.

In much the same way repeated stimuli on safety will be effective in getting attention directed to the solution of the problem which is in the focal point of view when the stimulus is given. Of course, the stimulus should not be a constant one, with never a break, or the individual may become so familiar with it and so adapted to it, that he fails even to notice it. A lady visiting a meat-packing plant said to a workman in the killing room, "My, what a terrible odor! How do you stand it?" His reply was, "Well, lady, this isn't so bad because you use nice perfume. The other day some dame came in here with the most gosh-awful smelling stuff." Evidently they weren't attending to the same odors. The workman's sense of smell was so adapted to the constant odors of the killing room and that of the lady to the odor of a spicy perfume that neither of

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them paid attention to the odors that were always with them. On the other hand, they each gave attention to the odor to which their sense of smell was not already adapted.

Sometimes in promoting safety the stimulus is so constant that the men become adapted to it and do nothing about it. On the other hand, if the stimulus could be made persistently recurrent instead of ever present, it would gain attention and they would do something to remove the reason for its recurrence from specific sources.

Variation in approach seems to be necessary to direct attention. If you have a large group with which to deal, you will find that some respond well to one method and that others are stimulated to attention by still another method. Thus, it is wise to vary the approach to gain the attention of all concerned.

If you are dealing with single individuals, it is still wise to vary the approach. In so doing, it is possible to avoid the danger of having the individual become so familiar or so adapted to the one method with which he is so well acquainted that it loses its meaning and no longer attracts his attention to safety.

Attention as a Result of Interest.—In another paragraph it was pointed out that interest follows attention. Although this is so, it is also true that it is easier to attract attention to points similar to a channel of interest already established than to points that have no relation to the individual's

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background of experience. Therefore, it is wise to use the background of things to which a man has previously given attention as a starting point for new points to which you would have him attend. Interest follows attention, but when the attention has followed in a given direction so often that a channel of interest made up of points of attention is formed, it is easier to gain attention to something closely related to that channel, than to something entirely foreign to it. A boy was not at all interested in building model airplanes and gave no attention to it when his friend tried to persuade him to build one. The boy's father wanted his son to build model planes like the other boys of the neighborhood. He offered to contribute five dollars to a fund for the purchase of a new bicycle, which the son wanted very much, if he would build two different types of model planes. To get the money the boy built the planes. The repeated attention that he gave to the task under proper motivation became a channel of interest and he built many more models. He began to sell them. After a year had passed, his father called him to his side one day and said, "If I should offer you ten dollars to finish your bicycle fund or to buy equipment for making model airplanes, which would you use it for?" The boy promptly replied, "The model planes because I've used all the other bicycle money for that already; anyhow, I'm not paying any more attention to bicycles." He was now interested in model planes. It was not at all difficult to get him to be

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all eyes and all ears and all activity whenever the subject was mentioned. It was easy to get his attention along this line because it was an extension of the channel of interest developed by the previous attention he had given to that particular line of activity.

In a similar way attention to specific problems and to the general attitude of safety can be promoted best against the background of the things to which men already attend, the things in which they are interested. There are several definite lines of approach to this endeavor to direct attention on the basis of previously aroused interest.

Instruction must be tied in with things that are already of interest. As in the case of the boy who attended to the task of making model planes because it would promote his interests in a new bicycle, so in the case of every individual you must start with something to which he already subscribes, and which will serve as a motivator to do the new thing. To attempt to instruct in an entirely foreign field, unless it has its own motivating forces, is like trying to take a person from Chicago to New York when he is somewhere in Texas and doesn't want to go to either Chicago or New York. First, one must find where the individual is and what his interests are. Then he must be motivated step by step in the new direction.

In the case of teaching safety or of directing attention to safety, the problem should be comparatively simple. First of all, the man is already in-

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terested in avoiding personal injury and pain. Second, he is interested in continued earning power. Third, he is interested in promoting his own self-pride. There may be many other relevant interests, but these are usually sufficient to provide a good starting point.

The task then is to tie the points concerning safety to which you wish him to attend into the structure of these other interests so definitely that they have specific meaning to him as he exhibits those other interests. If that is done, the new idea becomes nothing other than an extension of some line on which he is already working and he will grasp for it readily. He may, after attending to it for a while, get so interested in the new idea that he will promote it for its own sake. Such has been the history of the making of many a safety director in industry.

The one who wishes to direct attention to safe practice and safety attitudes should establish a good personal relationship with his students. If a student, be he in school or a workman in industry, he has high regard for the one who is attempting to direct his attention toward specific lines of activity and will tend to follow the direction because to do otherwise would be a breach of the personal friendship, regard, or esteem which enters into the good relationship. We all like to do things for people we like. Even in those cases where we dislike the thing to be done, we do it anyway because we like the person who suggests it.

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A little boy didn't want to take music lessons; he didn't like to practice; but he told his playmate that his mother and father wanted him to take lessons and to practice and he liked his mother and father, so he would practice even a few minutes longer than required because they would like that. He would play ball with his playmate tomorrow. These mutual likes aid much in getting things done.

The good personal relationship need not be a close personal association in all the activities of life. It may vary from intimate personal friendship to esteem for the individual because he is just and shows integrity and ability, even though he is aloof and untouchable in a social way. Usually, however, there must be some evidence of common understanding and genuine human sympathy in the critical situations of life.

A foreman who had a perfect record in getting the men in his department to wear goggles was asked how he accomplished the seemingly impossible task. His answer was to the effect that he had made his men attentive to the matter of eye safety because they liked him; and that they liked him because he had made it his business to find something to like about every man and had been just to all of them. You may say that this is too much like a mutual admiration party and that full-grown men shouldn't be treated that way. Why not? It gets the results you are after and everyone feels better. We sometimes lean over backward to be grown up, whereas we would appear much bigger

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if we stood erect in childlike simplicity and did the things that must be done in the only way they can be done. The only way safety or anything else can be taught successfully is under the conditions of mutual good personal relationship or regard and esteem between instructor and pupil.

To direct attention against the background of interest already established it is wise to promote the welfare of the individual both in the subject studied, in this case safety, and in outside activities. After all, the human being is not split up into separate compartments as far as his existence is concerned. Every individual is interested in himself. Anything that promotes this self-interest is likely to challenge his attention. Therefore, his activities in the field of safety should be noted, and he should be given a chance to develop his own self-pride in them for the promotion of his own interests.

Since most men have family ties and are engaged in other activities while away from the job, a little bit of interest shown in these outside activities usually goes a long way toward building up mutual respect and good human relationship. It would be a rare case of an ungrateful man who would condemn your safety ideas just after you had inquired about his sick child or had told him how polite his boy was last night when he came to collect for the newspaper. If you have common interests in one area, you can and likely will have common interests in other areas of life as well. To be sure there is no guarantee of this transfer from one area to an-

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other unless you call attention to it; but the scene is set so that you can, without patronizing the man, ask for a return of the interest and attention which you gave him, in order that together you may promote an equally beneficial idea or activity for mutual self-interest and development.

Men are more apt to give attention to things closely connected with their basic drives, wants, and needs in life than to things that deny or do not directly promote the satisfaction of these drives, wants, and needs. These are the fundamental motivating forces of all activity. Any activity motivated by superimposed motives which in the end deny the satisfaction of these basic motivators will eventually be doomed to failure or reversal.

Thus, an intelligent approach to the problem of gaining attention to safety requires that we study carefully how best to adapt the safety program to the satisfaction of such basic drives as hunger, self-preservation, need for shelter, and satisfaction of the sex urge. Provision must also be made for the satisfaction of the wants and purposes of life immediately derived from these more basic drives, such as family life, provision of good homes and appropriate clothing, group activity and community life, security of position, and a means of providing good food, with something left over for one or two luxuries to promote self-pride. When the safety program definitely takes these things into account, it will attract attention. A man does not expect that a new house will be given to him because he is

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attending to the idea of safe practice on his job; but he may be shown that safe practice will avoid the unpleasant circumstance of having the new house, which he has built, taken away from him because he failed to play safe. Sometimes men do not think of such things. By a little careful planning you can find some way to tie safety up to the chief motivating forces of every man's life, so that he will give undivided attention to you in any well-constructed plan of safety you attempt to promote.

Attention Toward and Away From.—Sometimes we follow all the rules of gaining attention but forget in what direction we wish it to go. We fail to realize that it may be turned away from the goal we set rather than toward it.

A young lady once set out to attract attention to herself with the idea of becoming more popular and better liked. She proceeded to ask everybody she met, "Don't you like me? Don't you think I'm nice?" She was not too unattractive or undesirable and she thought that if she gained the attention of enough people often they would become interested in her. She was correct in her assumption but it all depended upon the direction she gave to that attention as to whether they would like her or dislike her. People did pay attention to her; they became interested in her; they tried in every way to avoid meeting her or being seen in her presence. Some of them even said very nasty things about her.

Safety is sometimes made about as popular as the young lady just described. Attention is directed to

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it in such a way that the chief interest becomes one of a means of escape from it; how to be safe against safety or how to become immune to its persistent thrusts. Safety, like the young lady who would truly become popular, must be promoted because it attracts attention for what it really is and what it does, rather than because of its ability to beg and pester, which, although it attracts attention, drives people away from its true values rather than toward them. Make the safety program attractive. Make safety attractive and make it active and it will get attention. If it begs and commands attention, it may get it with the results in the wrong direction. This was the case with the workman who had heard so much preaching on safety and had seen so little of the attractive evidence of it. He came from a meeting in which safety, for the sake of the safety department, had been too highly eulogized. He could stand it no longer. With one mighty swing he tore the guard from his punch press and said, "To hell with safety." The safety program got his attention. He went *away from* rather than *toward* it, not because he wanted to lose a hand and not because safety was unattractive, but because his attention to the subject was pointed in the wrong direction.

Promotion of Interest in Safety.—Thus far the discussion has been centered on directing attention to safety as the necessary prerequisite for becoming interested in it and for learning methods, specific practices, and the attitudes of safety. What more

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can be said of interest in relation to the problem?

If we remember that interest tends to follow attention, we will then also presumably remember to guide attention when we wish to arouse interest, rather than bewail the fact that there is no interest. If there is no interest in safety, it is because there has been a failure to direct attention to it often enough or strongly enough to cut a channel in that direction.

Without going back to the underlying attention situations there is a possibility of doing something with interest on its own level. It must be remembered that interest is never created or born; it is aroused or directed. Fundamentally, it is derived from a channel of attention points, but this derived interest may be dealt with on its own level. All men, with the exception of a few very apathetic ones, are interested in something. You do not create new interests in them, you merely guide a generalized interest into a specific channel or arouse a certain amount of interest that has been lying dormant.

It is quite evident that whatever the nature of interest, it is something that may be redirected and remolded, and that it is not so necessary to worry about creating more of it in most people as it is necessary to devise ways of using what they are already capable of exhibiting.

In the case of directing interest into the channels of safety, one thing appears to be of importance; namely, that men must be made aware of the natural interest they have in self-preservation and self-

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pride. This can be done by several methods. First, as pointed out above, by relating the motive forces and drives of their lives to the safe continuance of their existence through safe practices and proper attitudes. Second, by making them vitally aware of their interest in safety as a means of enhancing the total pattern of their existence through

1. Appeal to family.
2. Appeal to security of position and means of livelihood.
3. Appeal to job pride.
4. Appeal to fair play.
5. Appeal to regard for a worthy leader and the organization he represents.

The individual already has pretty definitely established interests in all of these channels. The task, then, becomes one of showing that safety fits into all of these channels as a means of making a more complete picture of each area separately and of the total pattern collectively.

In the arousing of interest in safety we do not want to make a separate channel of it. Safety is a part of all these other things. We merely want to get it included as a vital factor in the total pattern where it really belongs. Too often we have spoken of safety as if it were an entirely separate and unrelated entity. Actually, the term "safety" should be discarded and the term "safe practice" used in its stead. It is a method, not an entity. The safe method is the most efficient method and the method of activity that best promotes the other interests

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which are already so deeply ingrained in human behavior. Thus to make safe practice a part of this ingrained behavior, we must know that behavior well enough to be able to adapt safety promotion to it. Too many times we have tried to ignore the deep-seated human ways, to deny, as it were, that human beings are like human beings. We have tried to thrust new patterns upon them as we would upon a blank wax form, when they are not blank forms but actively receive or reject what is thrust at them in accordance with what they are by fundamental nature and by past experience. To interest them in safety, we must find what their nature is, what past experience has made them, and what channels of interest already exist, into the pattern of which the idea of safety is to be woven.

Above all, let us not forget that these human beings are rather practical and that, although most of them cannot tell how their interests are directed or even why they have them, they do have them and they know it; they know, for instance, that they are interested in their families. If we would be practical in teaching interest in safe practice, we had better tie it right in with the promotion of family interest. They are interested in doing a job of which they can be proud and in being secure in that job. How those interests were developed is little of their concern. They have them and we would do well to tie safety into them. They cannot be denied and, if safe practice becomes an integral

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part of these interests, attention to it cannot be denied.

Attitudes.—Attitudes are the crystallized forms of attention and interest. They are usually symbolized and often named. We wish to develop an attitude which we would call the safety attitude.

The interest in specific safe practices, as already pointed out, should be included as a part of the more fundamental interests of human beings as such. On the other hand, it seems advisable to build from the mosaic of these other interests a general attitude of safety. This can be done without destroying the other patterns or without disrupting other related attitudes. The same interests and points of attention may be combined in many different ways, and used over and over without loss. The individual elements are much like the alphabet which always remains no matter how many times you use the separate letters in the almost unlimited number of combinations to name objects and express ideas.

This general attitude of safety or of safety-mindedness, then, may be developed by various methods. From composite factors grows the attitude to which we give a name, or symbol. Some of the methods of developing the safety attitude are worthy of discussion.

Safety as a Regular Part of the Job.—Safety should always be treated as a regular part of the job by which men earn their living and of which they are proud, rather than as a special added fea-

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ture belonging to external authority and a special few who are interested in reduction of costs and saving of compensation.

First, safety is actually an integral part of the whole pattern of effective work or play. In practically every activity of life, we say that a thing is skillfully done only when it is done by the safest possible methods. Of course, murder may be an exception to this. It may be skillfully performed and yet there is always something unsafe about it for someone. Some of the practices in various occupations have, in the past, been exploited for a type of efficiency that was not very safe and sometimes a look at the accident record of these specific cases makes one think of murder.

In a human-centered world the human being must be at least as valuable as an extra hundred tons of steel rails or of coal or a thousand pretty gadgets. In fact there should never be any comparison. It is the moral obligation of a group of humans to safeguard the individuals of the group, lest the whole structure fall. Compensation laws, which evaluate the human being in terms of the money he has come to regard so highly, have forced organized industry to assume a legal obligation which in part forces recognition of the importance of the human being.

With present-day compensation laws as they are and because of the fact of the high cost of training new men, when experienced men have been injured or killed, costs are definitely related to accidents.

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In the reverse order of statement we may also say that safe practices reduce costs.

It is evident that safety and efficiency of production go hand in hand. It is also evident that safety and costs are correlated; and it is doubtful if anyone would ever argue against the statement that efficiency and costs are closely related. At present there are few studies available to show the interrelation of these three factors in effective work. Recently a safety director in a large steel mill found that five departments had broken the all-time record for days worked without a lost-time accident. He also found, on investigating, that each had broken the all-time records for both production and low cost during the same period. He is an enthusiastic believer in the idea that effective production includes efficient and safe practice as integral parts of one and the same pattern.

The second point of interest in treating safety as a regular part of the job is that in so doing it is made the problem of the individual who performs the job, rather than that of some special supervisor. Too often men on the job are made to feel that safety is a specialized job for the safety department. One workman expressed this attitude to an inspector, who asked him to make suggestions for increasing safety, by saying, "Safety, that's *your* baby. Why don't you take care of it? I have enough to do when I operate this lathe."

The way men are approached on this idea of safety does much to give direction to their attitude

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concerning it. Too often the approach is one in which someone tries to thrust something concerning which he is enthusiastic into the lap of someone who, he believes, does not have any desire for the thing he offers. This whole picture is wrong. In the first place, safety is not the special possession of the safety directors or of any line or staff supervisor; in the second place, men are already interested in their own welfare. However, when a man is told to work safely so the costs will be reduced and so that a good safety record can be shown to the front office, he begins to doubt if safety is *his* problem. It looks to him as if some foreman or safety director wanted a good record in order to hold his job or get a promotion. The man begins also to feel that perhaps this fellow is a parasite who does not produce and who just comes around every so often to irritate honest workmen. Not only is this general attitude toward safety held, but it is often expressed in just about the terms used in the foregoing sentences.

To make safety a part of the job, the supervisor must begin at the point where he has a new man to train or a man to train on a new job. He must teach the safe practices as well as the mechanical techniques. He must point out that the job to be done correctly must be done safely, and that skillful performance is safe performance. Further he must be aware of the necessity for training attitudes and interests of the new man which are not directly a part of the operation of a specific machine, but

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which contribute so largely to his success in an organized group.

For both the new and the experienced man it is necessary to point their attention in the direction of safe methods and attitudes of safety as a means of protecting their own self-interests. So often we make it look as if it were our interests he should promote. If he is given an opportunity to promote his own interests, he will promote ours also, if they are related.

On the other hand, one very successful safety director in a small organization promotes safety almost entirely on the idea that the men should have the correct attitude toward safety and work safely so that he can show a good record. He tells them how good his record is and asks them to help him keep it that way; and they do. Here the secret is that the man is a very popular fellow who knows most of the men by name. They would do anything for him because they like him. More than that, they do not believe he is interested in safety just to make a good record for himself. They feel that he has a keen personal interest in each one of them. He promotes their interest; why shouldn't they promote his? But, this method does not usually work. Either the group is not of the proper type or the man who is promoting the idea is not actually popular enough to carry the entire group. In large groups such a method would be almost impossible; you just cannot please everybody.

If attention is directed to safe practice in the do-

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ing of the job and the interests of men in their own welfare are promoted, men will practice safety. If these interests are symbolized and named so that the symbol or name includes the safe practices, ideas, and terms of safety, an attitude will be formed concerning safety. That attitude will be a positive or desirable attitude if attention has been directed into the proper channel. It will be a negative or improper attitude if attention has been directed into the improper channel or in the wrong direction. It may even be an attitude of passive acceptance of the idea rather than active promotion of it, if attention is directed only to the acceptance of the idea and not to the actual safe practice and promotion of the idea of safety.

It is not enough to think about safety. Safe activity must actually be practiced. The reason why the attitudes toward safety are so incomplete is often that the attention has not been directed to the complete pattern of the problem. We would scarcely expect a child brought up in the woods to have the same attitude toward the great city as the child brought up in the city. Yet, we often expect men who have never had attention directed to the active work of promoting safety to have a proper attitude toward the subject as promoted by some staff officer. People will develop a proper attitude toward promoting safety if they are given a chance to do and *attend to* its promotion. But, if the program belongs to someone else and is not made an

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integral part of their jobs, why should they be all
enthused about it?

Attention to "Little Things."—A second group of factors in developing the proper attitude toward safety involves the promotion of the interests of the individual under your supervision by careful attention to the so-called "little things" of life.

Personal Problems.—The good leader must listen to the seemingly foolish problems of men. They are their problems. He must not laugh at them. No matter how small and trivial they may seem to the other person, they are the very center of attention to the person who has them, until they are solved or dismissed. Men do not work safely when their attention and interest are drained off into the channel of their own personal problems rather than into the channel of their work; neither do they pay much attention to safety instruction when they just can't get their minds off what is bothering them.

A skilled workman who had never had a serious accident was seen taking some very foolish chances one day. The foreman did not wish to discipline him until he was sure what the trouble was. He called his men together on the floor and gave them some safety instructions. The workman in question did not seem to be paying any attention even though the talk was chiefly for his benefit. The foreman drew him aside after the others had resumed work and asked him if he did not believe in safety any more, and suggested that he might get hurt or killed if he continued taking chances. The

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man told him that he had not meant to ignore the talk or even to take chances, but that he just could not think straight today because his wife had been cross with him for several days and was going to leave him and he did not know why. Then he added that it might be well if he did get killed, because he guessed he didn't amount to much anyway. The foreman sat down and let the workman talk the whole thing "off his chest," until the conclusion was reached that he had a good record in the past and that, no matter what happened at home, he still wanted to be a good workman.

Every good supervisor knows that he must listen to types of problems that bother his workmen, such as, the disrupted family, the unpaid rent or mortgage, and the repossessed automobile or furniture.

There are many others perhaps; but in every case the good leader must be the safety valve or weeping post for his followers. They must get rid of the pent-up emotions before they can act safely, follow instructions concerning safety, or develop proper attitudes concerning accident prevention.

Grievances.—All grievances must be handled as quickly as possible. Undoubtedly, the best way to handle any grievance is to avoid it. However, if it has arisen, it should be carefully and justly dealt with. Every grievance, no matter how intelligently handled, is likely to leave a scar; but better a scar than an open wound inviting infection in the form of greater grievance. A person with a grievance is not likely to act safely, nor is he likely to pay much

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attention to safety instruction. He is likely, however, to develop negative attitudes toward any program you try to promote which is not one that directly removes the cause of his grievance. As a supervisor you must take care of all grievances *lest a man cut off his finger to spite his supervisor.*

Unsettled grievances not only make a man prone to accidents because his attention is directed toward the grievance rather than toward his task; but they tend to develop an attitude of unwillingness to follow instructions and to cooperate. Under such conditions, any attention called toward a safety program is likely to go in the direction of causing the one aggrieved to form an attitude against the program rather than for it. He is just too human to see that the program is for his own good. By all means settle all grievances that cannot be avoided before you try to develop the proper attitude toward safety. High morale and safety are traveling companions in present-day living; grievances are the robbers along the road who will waylay and destroy both.

CHAPTER VIII

LEARNING AND SAFETY

It may be true that learning of any sort is entirely personal; but it is also quite often true that the direction of learning and the material learned is determined to a great degree by the instructor who sets the scene. In the teaching of safety, as in any other subject, the instructor or supervisor bears the responsibility of so setting the scene and establishing the conditions, that the individual whom he is instructing may learn correct and safe habits of thinking and acting. If you would teach safety you must develop conditions that are conducive to the learning of safety.

The Safety Habit Must Be Learned.—Learning is the establishment of a definite relationship between a stimulus and a response; the conditioning of a response to a stimulus, so that the general pattern of the response, at least, may be predicted if the stimulus is known. Almost any response that man is capable of making may be connected in this definite relationship with anything that serves as a stimulus to him. However, these responses become individualized to the stimulus. The establishment of such a relationship is called learning.

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The learning of a certain language, the development of social attitudes, and the learning of safe practices are the results of the type of stimulus provided. Safe practices or unsafe practices are learned and, by frequent repetitions, become habits. When we observe two workmen doing a given job, the one safely and the other unsafely, the tendency is to say that the one has learned and the other has not. That is not quite true. They have both learned, the one a set of good habits, the other a set of bad habits. The worker in industry has good or bad habits according to the way he has been taught by his supervisor.

Either the safe way or the unsafe way to do a thing is learned. One man learns to take chances, the other learns to avoid them. One learns to be attentive to the proper things about him, another learns to attend to other things. It is not true that one is possessed of attention and the other not; both men attend to something, but, by habit, one attends to the limited field of his activity and the other to things outside of that limited field. They both have learned their habits. The one is likely to be safe, the other unsafe.

Change of Interests, Motives, and Purposes.—If a man is learning the unsafe way of work, play, or procedure in any activity, rather than the safe way, it is probably because his interests, motives, and purposes are misguided. There is probably very little incidental learning. In learning anything, attention plays an important role. Interest follows

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attention, and secondary motives are built around our interests. Attitudes, purposes, or goals to be attained are also developed from the material of our interest, and against the background of our experiences, which follow the line of interest.

In order to change a person from unsafe to safe practices, one must direct his attention into channels of safe practice; change the direction of interest, the structure of the system of motives, and the thought-out goals or purposes of the individual in question.

Fundamental drives upon which interests, goals, and purposes are finally based are not changeable. One cannot legislate against hunger, sex, thirst, etc. However, the way in which these drives are satisfied may be varied. It is the learned habit system, devised for the satisfaction of these more or less biological drives, which may be at fault and which thus requires changing. It is essentially true that man is interested in anything that promotes the preservation of his own biological being. On the other hand, he may show interest in conflicting drives or motives. To earn a few more dollars in order to gain a more sure satisfaction of his wants, a workman may risk his life by taking unnecessary chances. All this is probably due to the comparative length or breadth of view taken of the two alternatives involved in all such cases.

Since the fundamental drives cannot be changed to any great extent, we are left with the problem of establishing proper habits through the direction of

attention, interest, and attitudes into channels which, taken in the long view, will best satisfy the fundamental motivation, drives, needs, and wants of the individual.

Formation of Definite Stimulus-response Relationship.—If the safe way of work or play is to be expected as the usual procedure, we must establish that way, assuming that we know the safe way, in both the mental and physical activity of the individual. Then we must find a way to set up in him a resistance to any change of his way of thinking, reasoning, and acting, in order to prevent him from developing unsafe stimulus response relationships. We must not only help him to establish safe thinking and safe acting as habits, but we must safeguard those habits against the possibility of influences that would change the direction.

Laws and Conditions of the Learning of Safe Practice.—The learning of safe practice follows much the same laws and conditions as the learning of school subjects, social adjustment, or acts of productive skill. To set the scene for the learner is just as necessary in safety as it is in any of the foregoing fields. The learner must be ready to learn. The stage must be set.

The individual is ready to learn when his attention is focused on the point to be learned, when his interests are canalized about the thing to be learned, and when his attitudes are favorable to the total goal or purpose toward which the specific thing to be learned points.

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Effect of Things Taught.—The effects of other practices as compared with the safety instruction and practices must be considered.

If the immediate effects of safety instruction are more unpleasant than pleasant, or more annoying than satisfying, you may rest assured that the line of attention and interest will be in the direction of escaping the instruction. Also, if the practices called for are annoying and arouse emotional resentment because they conflict with long-established habits, they will not be readily learned.

We must then find some way of making the safety instruction and the actual application of safe practice more effectively satisfying than the absence of such instruction or the following of unsafe activity. Sometimes it is exceedingly difficult to make the application satisfying, because it requires a change of ways and offers thus a difficult expenditure of energy, which is against the fundamental principle of the conservation of energy by the biological organism, which tends to follow the line of least resistance. We should remember in this regard that the well-established habit is always the line of least resistance for any individual, even though it may look like the hard way to us. The old way is the easy way.

There is a possibility, however, of overcoming the difficulty of the fact that the immediate effect of any change is annoying. The human beings with whom we deal have memory and also creative imagination. This makes it possible for us to give them

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a long-time view of the comparative practices, and gives us a chance to demonstrate that in the end, or over a long period, the correct or safe way usually is the way that requires less energy and is far more satisfying than the unsafe way. We are responsible for enlarging the picture to show its details and for extending the limits of time beyond the immediate present to point out directions or trends.

Another aid may be used in promoting the effect on the side of safety. By making the infraction of safe practices annoying and the following of safe activity pleasing, by the way in which the individual is treated as a result of his infractions or his proper adjustment, we promote learning of safe practices. Let us here remember that the positive is better than the negative approach. In the final analysis we are interested in bringing about a condition in which the scene is so set that safe practice is totally more pleasant than unsafe practice. If men are more annoyed by the conditions about them which we think should lead to the learning of safety than they are by the unsafe ways of acting, they are likely to learn the unsafe ways. We sometimes make the safety promotion so unpleasant that attention is chiefly called to a means of escaping it.

Men Continue Their Recent Practices.—The activities and attitudes most recently engaged in have a strong influence on what is to be learned. Men who have been using unsafe methods of work are not likely to change all their former practices and habits, just because they are told of a different way. Even

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if they attempt to change, the very things they do to accomplish the new method are influenced by their recent ways of thinking and acting.

The former practices still are the channels of least resistance. Unless carefully guarded, any stimulus given, which is related to the former activities, will be likely to flow through the old channels. Often when we try to teach a new or better way of doing a thing, we merely reinforce the old way. The stimulus we give gets fixed to the old response and the more often we give the stimulus the more fixed the response becomes.

If there are several possible reactions to a stimulus pattern, we may expect that the reaction most recently engaged in, other things being equal, will be the one to be repeated. The entire body, including muscles, nerves, and glands, is prepared to act in the one way rather than the other. Any stimulus that will call forth this reaction, or one similar to it, except for certain variations, will call forth the reaction pattern that does not include the variation, if the body has not recently been in the habit of including these specific parts of the reaction pattern. Thus often the supervisor teaches unsafe practice, because the worker interprets his teaching against the background of the recent methods he has been following, when they are the very methods the supervisor is trying to change. Stating the point of desired change clearly will help to overcome this difficulty.

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Repetition of Activity.—Other conditions such as effect and recency being equal, the more often a thing is done in a certain way, the more fixed that particular way becomes. The more often a worker practices the safe way of working, the more rapidly he learns the safe way. The more often the scene is properly set for him, the more often he practices the way it is set. The more frequently the worker is himself aware of safe practices as substitutes for his former unsafe activities, the more rapidly he learns to think along the lines of safety. If he can be led to think and act safely often enough, he learns to be safe. He learns the safety habit. He learns to be safety-minded.

Transfer of Specific and General Safe Practices.—Often in the learning of safety we who teach it confine our activities to the promotion of frequent action on specific jobs or movements, and fail to do the other thing that is probably more important. We forget to teach the more generalized habit of safety. A workman had learned all the safe and efficient practices on a punch press. He was transferred into the bar mill. Here he was injured on the first day. He had not learned to think about safe procedure. On his punch press he had been taught specific safe practices, but he had not been taught to be safety-minded. He was safe enough by habit on one job and within a narrow range, but he had failed to learn the more inclusive habit of acting safely in all areas of his life. The failure should not all be attributed to him, however, for his former

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supervisor was responsible for setting the scene and should have taught general safety-mindedness as well as the specific safe procedures on the punch press.

If specific safe practices and general habits of safe procedure and safety-mindedness are to be learned, it is necessary to set the scene for frequent activity along all these lines. The individual is not safe until all these are included, and until he has learned all of them to the point of habit.

Do not assume that there is a transfer of training from one specific safety practice to another. Do not assume that the safe habits on a specific job will transfer to another job where the activities are different.

We have argued in years gone by whether or not learning or training was transferred from one situation to another. There is at present considerable agreement among students of the problem that there is very little transfer. It is best to assume in the promotion of safety that there is none. It is wise to assume that the man who has learned to be safe in a coal mine must be definitely taught how to act when he goes to work in a steel mill. Even in the coal mine when he changes from hand mining to mechanical mining, he must be taught the safe practices of the new method or job.

Identical elements in two situations seem to transfer. The coal miner who has learned to stoop to keep from bumping his head on the low roof of the working face may also transfer the stooping activity

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to his job behind the new scrap bailer installed under some low steel beams in the mill. These particular features of the two jobs are nearly identical. Yet it is best to call his attention to the low beams behind the scrap bailer, or there may be a lacerated scalp to be treated.

Do not assume that the man who always knew how to keep his hand out of the band saw will likewise know how to keep it out of the buzz saw. He may, if he has been taught to the point of learning that he should keep his hands away from all moving objects. But if he is assigned to the buzz saw instead of the band saw, teach him how he shall move his hands to operate it.

There are certain general habits to be learned, which will include many specific cases. The person who has learned to stop, look, and listen as a general habit before proceeding at any activity may be able to discover specific danger points on widely separate types of situations. Likewise the person who has learned not to step on loose objects may be safe in many situations varying widely in their specific patterns.

Although some of the general habits that may be learned include many specific cases, it is best to give instruction in specific cases. Attention should be directed to the way of acting in the particular circumstance of the specific task. The general habits should not be neglected, but they may not cover the exact details of safe practice on the specific job. It is very good if a new lathe operator has learned

to observe closely the hazards and possible general safe ways of acting, but it is still necessary that, besides this general habit of attitude toward safety, he learn the safe and skillful movements that will make it possible for him to operate his lathe safely.

Teach the Whole Job.—The question often arises as to whether the job should be taught as a whole or part by part in a learning situation. Should a child learn a poem by reading the whole selection over many times, or should he commit two lines to memory and then two more and so on? Should a man learning to operate a shearing machine observe and practice the general operation, or should he learn, part by part, each step in the job? In general, the answer to such questions is that the whole method of learning is the more economical in the long run.

In the case of the part method there seems to be more rapid progress at the beginning. However, each individual part gets equal importance in the mind of the learner, which of course is rarely true in the final setup of the job. After the parts are learned there is still the necessity of fitting them together in their proper relationship.

In the whole method, the general relationships are learned first. The relative importance of each part is made evident in the relationship. The learning seems slow at first, for no part of the task can be accomplished at the end of a short period of learning. However, after a sufficient time the whole task is learned. The actual time is shorter when using

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the *whole* method than when using the *part* method.

If the task has been learned by the part method and the parts fitted together quite often, any distraction while the task is being performed causes a breakdown of the procedure at the junction of the parts as they were learned. This is probably true because of the fact that the general relationships are so often neglected in the part method of learning. When such breaks in the task occur, the performer quite often spoils material or injures himself. In addition to the fact that the whole method is the more economical, as far as the time consumed in learning is concerned, it is also the more efficient and safer way when the final performance resulting from the two methods of learning is considered. Use the *whole* method in teaching wherever it is possible to do so.

There are some tasks that carry with them special hazards or are set up in natural divisions or parts, in which it is necessary to teach the individual these specific parts before he may proceed at all. After these have been duly considered, the *whole* setup should be viewed and then as the learner proceeds, the details in which he is yet lacking should be called to his attention. Let us not forget that, in either method, the foreman is usually designated as the instructor in any learning process no matter which method is used. It is his duty to teach both the general relations and the specific details of the job to be learned. Usually this can best be done by the whole method, by an instructor who is capable

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of anticipating the difficulties arising with specific parts and who is on hand to direct the proper procedure on these details as they arise.

Incidental Learning.—In safety, as in many other areas of learning, we too often make the assumption that the learner will learn incidentally from the things that occur about him. This assumption is not valid in most cases. One does not learn very much of anything unless his attention is directed to the thing to be learned, either by someone else or by the attention-getting qualities of the situation itself.

A foreman complained that he had a man who was "too dumb to live." The man had been injured. When the foreman was questioned as to whether he had properly instructed the man he replied, "Why, he was right there when his buddy got hurt in exactly the same way. He should have learned." A coal miner saw his buddy killed in a series of gas explosions because he got up and tried to run instead of lying face down until the explosions were over. Two weeks later he was carried from the pit with a fractured skull, because he tried to run through the passage during a series of minor gas explosions. Will these people never learn? No, not incidentally. Their attention must be called to the thing to be learned. Of course, in most of these cases, they learned something but not the thing that we might have expected from the accidents they had been in a position to observe.

Attention Precedes Learning.—We learn that to which we attend. We so often wave the left hand violently in one direction while we point mildly with the right in another direction. We so often shout so loudly that those who listen cannot understand the words we say, because of their attention to the shouting. Then we wonder why they learn to go to the left rather than the right, and in the direction of the shouting rather than in the direction of the words we shout. They have, putting it simply, learned what they have attended to most strongly.

In teaching safe practices or the hazards of a situation, the instructor must be careful to point attention to the thing he wants the individual to learn and not to other things. We sometimes give too much negative instruction, and the learner attends to what he should not do, and then forgets that he should not do it and proceeds to do it.

Instruction.—Instruction is only instruction, and as such helps to set the scene; it does not cause learning. Since it is a scene-setting and attention-getting device, it must be clear in its meaning to the one being instructed. The real learning occurs when the person does something concerning the scene as it is set by the verbal instruction. Sometimes we, as instructors, fail to do more than get the person to learn the verbal instructions, so that he can repeat them; we must get the learner to act in accordance with them. It is then that he learns correct practice.

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Since verbal instruction is a scene-setting device and as such is important, there are several points that may make it more successful in its purpose. It is a good idea to plan carefully the instruction to be given; to be sure that it includes what we want learned and excludes everything else. It is also wise to have the instructions repeated in the words of the learner. If this is done, he will reveal to the instructor where further repetition is necessary and where the meanings are not the same against the separate backgrounds of the two individuals. It is often surprising what meanings other people give to the words we say.

Demonstration.—After you are sure that there is a common understanding between you and the person you are teaching, you are ready to demonstrate the actual practice of the task. Some people are able to picture the verbal instruction in application to the task; others must see the task performed to understand the verbal instruction. It is usually helpful for any individual.

The demonstration should contain the elements of an actual situation and exclude irrelevant material. Do not demonstrate the use of a hammer by means of a monkey wrench; use a hammer. Do not show a man how to walk on a scaffold by laying a plank on the floor and walking with one foot on the plank and the other on the floor. He may try that method when he is thirty feet above the floor and one leg is too short. Furthermore, do not kick the pinch bar off the plank on the floor, for he may do

the same thing when he is high over somebody. Be sure you demonstrate what you actually want done and nothing else.

Length of Practice and Amount of Material.—When you first start to learn a new method or a new task, how long should the practice periods be? The consensus of opinion seems to be that short periods are more economical than long ones. This is probably true because of two factors. In the short period the learner, who is subjected to many tensions, does not become fatigued to the extent that would be true in a longer period. If extreme fatigue results, he is annoyed by the continued practice and learns ways of escape rather than of accomplishing the mastery of the task. The other factor involves the practice of errors. If a short period is used and followed by a rest or change of activity, some of the results of practice are forgotten. The errors are forgotten in about the same proportion as the correct procedures. When the practice is resumed, the attention is called to the correct procedures and they are reinstated while the errors are permitted to remain forgotten.

As instructors, we often make a very grave mistake in the training process, by calling attention to the errors of a former practice and dwelling on them at the time of resuming practice after rest. Leave the errors out of the picture and call attention to the correct procedure. If an error appears, stop the task at that point and give it direction in the correct way.

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Practicing too long fatigues the learner and leads him to attempt an escape from the task. It also permits him to practice over and over the errors that should be eliminated.

The length of practice periods may be increased as the learner becomes adjusted. Likewise the length of rest periods may be reduced. As quickly as possible he should learn to continue at the task according to normal schedule. The length of the practice period will depend upon the individual and upon the nature of his task. Make it just as long as it can be made without causing undue fatigue and the waning of interest. It must be long enough to isolate the task from other activities.

How much material should be presented at any practice period? Never more than the learner can grasp and integrate into the proper relationship of the task. This depends upon the ability of the learner, the nature of the material to be learned, and the ability of the instructor to clarify details as they are related to the total picture that has been given at the beginning.

Reviews.—Reviews should begin as soon as the learning process is under way. Cover the essential details as often as necessary. Never insult the learner by insisting on covering details with which he is perfectly familiar just for the sake of covering them.

Reviews should be properly spaced. At first, each day's progress should be reviewed; later, the reviews should be spread out. Finally, when acceptable per-

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formance is evident, the reviews should be held only as details begin to fade out in actual practice, or as new ideas must be added. The length of time between reviews will depend upon the individual involved. Do not make the assumption that some people never need a review. In this matter of learning the safe method, close observation will show that everyone should be reviewed in his methods from time to time.

Forgetting.—No discussion of learning would be complete without a discussion of forgetting. Someone has said, "We learn by forgetting." He probably meant that we save the correct way by losing the other possible ways of doing a thing. Whether or not we take this viewpoint, forgetting is still an important factor in learning. One supervisor said his task would be easy if men never forgot what he had taught them. Of course, he was wrong, for he taught them many things that had to be changed when new methods were put into effect, to say nothing of the things he taught them that were actually in error. Men do forget the safe practices we teach them but, thank God, they sometimes also forget the unsafe practices they learn from us or others.

There is a belief prevalent among supervisors in industry, as is partially true in school and other life situations, that the slow learner retains what he is taught better than the fast learner. This is erroneous. The fast learner not only learns more in less time and continues at the faster rate for a longer time before he levels off, but he also establishes what

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he learns in many more relationships and thus retains what he learns longer and makes more varied use of it than the one who progresses slowly.

The thing that usually happens when there seems to be evidence of "easy come—easy go," as one safety director says, is that the one who makes rapid progress is not given detailed instruction in all relationships and skills. On the other hand, the one who progresses slowly is drilled in every point and learns what his instructor carefully sets as the scene. If the same effort and careful planning are used in instructing all levels of ability, we shall reap greater reward with those of higher ability than those of low ability. The fast learner does not forget more readily. He just hasn't been taught as he should have been. His progress has lacked some of the details necessary to the final and total picture. In safety work especially, we are too prone to let the bright fellow teach himself, and then call him dumb when his self-teaching does not cause him to fit our expectations.

If a workman has been taught new material or new methods, we would hardly expect him to return to the task the next day retaining all of the new material he has learned the day before. We should probably be well pleased if he retains 40 to 50 per cent of the new practices we put him through. If he is of average intelligence, he probably forgets half of what he learned within a day after he learned it. If he is very bright, he forgets less; but if he is very dull he forgets more of what he learned.

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The forgetting is most rapid just after practice stops and decreases as time goes on. Some material may be retained from a single practice period for the entire lifetime of the individual, but very little. All this simply means that men are going to forget what we try to teach them in safety, and that they must be reviewed over and over again until the important details of safe practice become fixed as habits.

If we assume that a man forgets half of the new material he is taught in a practice period before he returns to us the next day, and more than that if the interval is longer, we are prepared to go back and reestablish what he has forgotten. Which half is it, the first or the last? The problem is not so easy. There is no way of telling just what part of the former practice or how much of it the learner has forgotten, except to start him on the practice and watch him closely for evidence of what he has learned and what he has forgotten.

Wherever there is evidence that an essential part, detail, or relationship has been forgotten, it must be retaught. However, do not reteach the errors of the former day's practice if they have been forgotten. Let them remain forgotten. Perhaps nowhere are we so prone to teach and reteach what should not be done, as in safety instruction. A foreman told a workman on a cutting machine during every day of his training period not to make a certain movement as he had done on the first day when his finger had almost been cut. A week after the training period

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was over the worker cut off the tip of his finger. When questioned concerning the accident he said, "I remembered that I *should* or *should not*, but had forgotten which; now I know."

Eliminate errors as quickly as possible by substituting the proper activity, procedure, or attitude and do not dwell too long on what might better be forgotten. Call attention to the correct, the safe way.

The dull fellow, who learns slowly, also forgets more rapidly than the one who learns rapidly. He has less to forget and forgets it faster, which leaves him with much less of what he should know in a given time than the person who learns rapidly. This makes it necessary to review the slow learner more often than the others. However, none of them should be neglected, for they all may forget.

All Learning Is Individual and Personal.—In any learning situation, the instructor helps to set the scene to determine what shall be learned, but that is about all. Learning is a personal activity. However, the guidance or scene-setting activity of the instructor is all important. Through it the attention of the learner is directed, and he learns best what he attends to most.

In order to set the scene so that safety may be learned, the individual must be studied by the instructor. The same methods may not be equally valuable in getting attention and arousing interest in all persons. It is the responsibility of the safety instructor to know the individuals well enough to

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be able to set the scene for each one, so that his attention is directed and held on safe methods until they are learned. This is done not by command, but by good leadership which has established effective human relations.

The only person who can teach safety, or anything, must be close enough to those he teaches to know them as individuals and be accepted by them either because he is so extremely capable or because of his human qualities, usually the latter. In the case of the teaching of industrial safety, the foreman is the person in position and most definitely responsible for safety instruction. The safety director or engineer can best present his ideas through the foreman. He must in turn understand the individual foreman, to find a way to teach him to teach his men.

In the home, the parent is the one nearest the child and is thus responsible. In the school situation, the classroom teacher is more effective than someone too far removed in a supervisory capacity. The immediate supervisor, who is in close touch with the worker, determines how much safety will be learned in industry.

CHAPTER IX

THE WORKER'S APTITUDE AND ABILITY

Some individuals are said to be accident-prone. Just what is meant by such a statement? Does the man lack aptitudes, abilities, and capacities to do his task, whatever it may be, safely? Has he been placed at a task beyond his capacity and ability? Does he lack training or knowledge? Does he have bad habits of physical activity and attitude? Or is he unsafe under any set of circumstances? Each of these points should be discussed singly to advantage. Often they are confused by those who use the term "accident-prone."

It is scarcely correct to say that a person is accident-prone when he has the abilities to do a given task but has not been properly trained or has not been given the opportunity to gain the knowledge required for it. Likewise the usual scope of accident-proneness does not include those who have established bad personal habits, if those habits can be corrected.

The usual meaning of accident-proneness concerns the variation in individual abilities to do given tasks safely. Those who have certain capacities and abilities usually perform safely, whereas those who

lack these abilities and capacities quite often are the victims of accidents. It is difficult to teach or train an individual to do a task safely when he is working beyond his normal ability. The person who is working at a job for which he is not mentally fitted is likely to become involved in accidents. Men who are operating on jobs faster than their physical and mental ability warrants are unsafe; those lifting more or doing heavier work than their physical limits permit are in danger of accident to themselves or others.

Some Workers Are Less Capable than Others.
—In any given task some individuals are capable of meeting the requirements and others are not. There are gradations of most abilities and capacities rather than a complete presence or absence of them in individuals. Although individual differences exist in aptitudes and abilities, much as individuals differ in height and weight, the range of their variability may be greater in some of these respects than in the physical structure of the body. There is considerable difference in the physical stature of the thirty-inch dwarf and the eight-foot giant in the circus side show. They both have height but one has much more of it than the other. You would scarcely expect the dwarf to work effectively at the same bench with the giant. Yet that is just about what happens in many activities of life. It is what happens in industry when men of unequal abilities are assigned to operate machines at equal speed. There are many other ways besides the item of

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speed in which individuals differ; such as ability to lift, physical stamina, susceptibility to various job factors, intelligence, emotional stability, and so on. The evidence seems to show that individuals not properly placed in accord with their varying abilities and capacities have more accidents than is normal for their group.

Individual differences in any measurable quality seem to follow the normal distribution curve, provided the sampling is random and the number of cases is sufficiently large. This is true of the height and weight of human beings, the size of leaves on a tree, and the size of the stones in the bed of a stream. It is also true of the qualities of strength, speed, intelligence, and coordination of physical and mental abilities.

Aptitudes.—The most practical assumption for those who must select and train others is that aptitudes are not inborn specific patterns, but that they are learned patterns and thus may be taught. The degree of success in developing any specific pattern will depend upon the general capacities of physical structure and intelligence and upon the related habit systems already developed.

It would be foolish, however, to assume that a man thirty-five years old without any mechanical aptitude should be picked for a mechanical job when another man of the same age or younger exhibits a great amount of mechanical ability or aptness. True, the first one may be trained, but with difficulty, owing to the long-established habit systems

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that have gone in another direction. It would scarcely be worth the time and effort to train the first one when the second one is available and when the same amount of effort could be so much more effective if applied to further training in his case. However, if both men are to be included because of shortage of the labor, seniority, social acceptance, or other factor, one must assume that by diligent effort the first one may be trained.

The fact is that often by careful and persistent effort the first type is trained to become a better mechanic than the second, because the second is allowed to develop bad habits of application under no guidance because he was so good he needed no attention or direction. Such has been the case in school and in industry, as far as both skillful production and safe practice are concerned. It pays to exert training efforts, but it pays best to exert them where they will be most effective. Thus, for the sake of production and safety, capable and apt employees should be selected and carefully trained, *each individually*, according to his specific capacities and aptitudes.

Abilities.—To do any task safely an individual must have sufficient ability for his assignment.

A farmer asked his small son to hold up one end of an implement while he reset the jack that was supporting it. As soon as the jack was removed, the implement fell on the boy's foot and broke a bone. He just couldn't hold it; he wasn't strong

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enough for the job; he lacked the necessary physical ability.

A foreman gave a worker a written set of instructions for the very hazardous job of blasting a large rock. The man was not acquainted with the job and no other instructions were given, except that he should blast the rock and that in doing so he should follow what was on the paper. The man had failed to learn to read even though he had spent three years in the first grade and five in the second grade of the elementary school. However, he felt that he should blast the rock and proceeded to do so, killing himself in the attempt. He lacked mental ability to learn to read and also was too unintelligent to know that he should ask someone else to help him or to tell his foreman that he couldn't read.

Individuals may lack either physical or mental ability. Many jobs are beyond the abilities of those assigned to do them.

Low Intelligence and Complicated Relationships.—The individual of low intelligence cannot grasp complicated relationships; because of this fact, he tends to be accident-prone when placed on jobs that are beyond his level or capacity to grasp.

A study made in one industrial plant shows that employees in the lower intelligence class have a higher accident rate than those in the upper class. In this plant 6,829 male employees were classified on their jobs as *A*, *B*, *C*, *D*, and *E* on the basis of intelligence tests. It is true that they were not all

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doing equally hazardous work. However, the investigator offered the opinion that the lower classifications had the fewer hazards.

An examination of the record shows that the rate or number of accidents per year for 100 employees was as follows:

Class	Number of employees	Accidents per year per 100 employees
<i>A</i>	1,373	0.66
<i>B</i>	1,606	1.12
<i>C</i>	2,095	1.53
<i>D</i>	1,393	2.08
<i>E</i>	362	2.76

The distribution of intelligence was not vitiated by either the factors of age or length of service to a point where these factors had any significant influence on the results. There was approximately a proportionate number of old and young men and of men with long and short periods of service in each classification. There was a slightly greater number of men of short service in the *A* and *B* classifications than in the others. Since another study in the same plant shows that men with short periods of service have a higher accident rate than those with long service, we should expect that if there had been fewer of the new men in the high intelligence level in proportion to the total, the rate for the *A* and *B* classifications would have been even lower. Thus there seems to be some evidence for the assumption

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that men of low intelligence have more accidents than those of high intelligence.

When questioned concerning the factors involved in the results, the safety director who had made the study was of the opinion that there were two major items. First, the men of low intelligence were less capable of doing the same jobs or even less hazardous jobs than those of higher intelligence. Second, those of low intelligence did not grasp the instruction given concerning safe practice so readily as the others. If they do not grasp the significance of safety instruction readily, it must be specifically adapted to the individual; the lower the level of his intelligence, the more it becomes necessary that safety instruction be specifically adapted to the individual.

Place the Worker According to Mental Ability.
—Practical experience has demonstrated that many men are misplaced on their jobs. The job may require too little or too much intelligence for them.

The machine-shop foreman in a certain steel mill reports an interesting case. He had two men who were unduly dissatisfied. They complained about their jobs, they had grievances, they argued with each other, they spoiled considerable material, and one of them had far too many injuries of a minor character. They were both troublemakers. After several years of this, the foreman decided to solve the problem or get rid of the men.

He observed them for a period of three weeks and found that when the man with the higher intelli-

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gence (information obtained from records in the plant office) turned worms on his lathe, he was interested in his job and well content. When he had to turn straight shafting on his lathe, he was a discontented troublemaker. Anyone could turn straight shafting, but it took a good man to turn worms. The man of very low intelligence was quite happy when turning straight shafting but thoroughly discontented when he had to turn worms. Furthermore, he spoiled materials and injured himself too frequently while turning worms. It was evident that his level of intelligence did not fit him to work safely and efficiently at the more complicated task, and he was just as efficient as anyone else in the department on straight shafting.

The foreman's first thought was to get rid of the two men. So he gave the dull fellow nothing but worms to turn and the bright one nothing but straight shafting. In two weeks so much trouble had been stirred up that he took the occasion to ask that the two men be fired. Then the union stepped in and demanded a hearing.

The foreman took the two men back and reversed their jobs. The result is interesting. They have worked at their special tasks almost constantly for five years since the change was made. Both are effective workers; neither complains and neither has had more than a scratch or two since the new assignment was made.

There are certain routine jobs that men of low intelligence can do quite as efficiently and safely as

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men of higher intelligence, who are capable of doing the more complicated and more hazardous jobs safely.

Quite often the man of greater ability, put on a job that does not challenge him, is so annoyed that, because of tensions or bad attitudes, he is just as unsafe a worker as the fellow of low ability who has been given a job that is too big for him to do. It appears that proper placement of men on the job would eliminate much in the way of spoiled material and accidents and greatly improve productivity.

Of course, whenever one suggests selection and placement, someone will cry out concerning the limitations, such as seniority, which are upheld by the union in an industrial situation. Do not take those cries too seriously. If industry shows an honest effort to determine, by job analysis and job specification and a study of the effectiveness of various men on the job, the place where men best fit, the unions will not fight such efforts for long. In most cases the cries have been an excuse for not doing the careful work of finding out what kind of man can do each job most effectively with the greatest advantage to himself, the industry, and the social order. There are some limitations but do not magnify them until all has been done that can be done within the limits imposed. Then it will be surprising if the limitations do not recede or disappear.

When asked to name the chief problems in safety promotion, the safety director of a large plant said,

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"There are three problems! How may we determine how to select men and jobs which fit together? How shall we train the man who lacks knowledge on the task? How may better human relations be established? All three are important; but the first is the most pressing in its demands for a well-trained and scientific personnel department, and the last is imperative upon every supervisor."

Proper placement will, of necessity, include some factors other than level of intelligence. It will include such factors as physical ability and health, motor ability, special aptitudes, attitudes, interests, and perhaps several others.

Physical Fitness.—A study of the records in one company shows that those with physical defects or not physically fitted for the position, as shown by medical examination, had a lost-time accident rate two and a half times as high as the rate of the group with no physical defects. Age and experience were constant.

Minor injuries are aggravated by the existing physical defects of the victim. Poor health and physical disabilities also produce worry and so reduce a man's vitality that he becomes more subject to accidents than he would be under normal conditions. Many physical defects and disabilities prevent the performer from functioning in a safe manner.

Old Age.—The accident rate appears to increase with old age. Whether it is due to decreasing physi-

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cal or mental ability or to other factors has not been properly studied.

Of the 106 accidents occurring during 1938 in a plant employing 8,026 employees, exclusive of salaried people, twenty-four occurred to the 927 men who were above fifty-five years of age. The accident frequency for the various age groups was as follows:

Age, years	Number of employees	Frequency, per 100 employees
18-20	199	0.50
21-25	766	0.39
26-30	1,149	0.78
31-35	1,230	1.30
36-40	1,116	1.53
41-45	1,021	1.37
46-50	870	1.49
51-55	478	1.20
56-60	498	2.01
61-65	331	3.02
Over 65	98	4.08
	8,026	1.32

From these figures the point may also be made that the young employee, in the matter of service rather than in age, does not have a high frequency rate. However, in the same plant, the new employee (less than six months) from point of service had a frequency rate of 4.92 regardless of age, compared with 1.32 for all employees.

In most of the studies, the experience factor

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rather than the age factor seems to account for the high frequency of accidents among the younger group of employees whenever the rate is high for the low age group.

Older men on repetitive manual tasks requiring high-speed performance are definitely inferior in output over a long period of time to younger men.

Although this does not show that the older men are more susceptible to accidents, it is reasonable to suppose that, if driven to produce at the same speed as the younger men, they would be more likely to spoil material or injure themselves, since the evidence from common experience points to the fact that men working beyond their normal speed quite often do so at the expense of quality and safety.

There are some tasks that require very specific abilities such as finger dexterity, precision of movement, or even special sensory equipment, such as good depth perception. The individual who is placed on such tasks without the necessary ability is at once handicapped both in production and safety.

Accident-proneness.—Many accidents have been found to result from the placement of individuals at tasks for which they are unsuited, mentally or physically.

The knowledge of physical and mental fitness is important in preventing accidents. Many accidents are due to faulty attitudes, improper training, and bad habits. But certainly in many cases defective vision or hearing, epilepsy, heart disease, undevel-

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oped hernia, or other physical disability is the underlying cause of personal injury accidents.

The physical examination in industry is justified if it assists in selecting workers for the type of task for which they are physically fitted. Likewise, examinations to discover mental and emotional conditions for the purpose of proper placement of employees may assist in fitting the man to the job where he can work effectively and safely. The factors of physical and mental fitness, age, and perceptual motor levels are only a few of the many which go to make up accident-proneness. There is the whole area of attitudes to be considered. One must also consider emotional habits and other habit patterns of life. All of these contribute in making up the accident-prone individual. One may have all the abilities necessary to do a job safely and yet have a high accident rate because of bad habits or attitudes. However, it is wise to select those who have the aptitudes and abilities and then to develop in them the proper attitudes and habits, rather than to take those who have the correct attitudes but who, because they lack the necessary abilities, can never do the job safely.

This discussion of aptitudes and abilities points out the necessity of close study in order that men may be properly selected and placed on jobs for which they are fitted.

The error should not be made of selecting only the high ability man for every job. There are many jobs of such a nature, as regards skills and hazards,

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that men of very low ability can do them effectively and safely. The same job would be irksome to the man of greater ability and he would, because of the bad attitudes generated, be in danger of accident on such a job at which the man of lesser ability would be comparatively safe and happy.

Placing Men According to Ability.—The differences in ability and aptitude in the factors mentioned necessitate various procedures in the selection and placement of men.

A superintendent wanted to appoint a new foreman in his department. He had in mind a lathe operator who was skillful at his job and who in twenty years of service had never had an accident. However, he had given no thought to the other factors required in a good foreman. He approached the man at his lathe and asked him if he would like to be a foreman.

The man's answer was, "Don't insult me, Mr. Johnson. I'm a skilled lathe operator and you don't have very many like me. Lots of these boys could be a foreman, but I couldn't because I just don't like to and I can't plan and study and direct, and I do like to and can run a lathe."

Here was a man who was properly placed, but his ability on the job did not guarantee an equal level of performance on another job for which he did not have the ability, attitude, or even interest required.

If a man is to be picked as a supervisor, a different technique must be used than if he is to be picked

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as a lathe operator or an electrician or an unskilled laborer. Each job must be studied and the specifications noted. Then a man must be selected, by the proper technique, whose aptitude and ability fit him for that particular job on which he can work efficiently and safely.

For some jobs there are tests that may be used as an aid in making the selection, once the specifications are set up. If the specifications state the ranges of intelligence, mechanical aptitude, and emotional stability required for the specific job, it is possible to give the prospective employee tests to determine these factors.

There are some jobs that require men of high intelligence to do them safely; others may be done safely by those of low intelligence. Such information should be included in the specifications.

It is possible to test for many factors such as physical ability, intelligence, emotional stability, mechanical aptitude, specific skills, and the like. However, it is useless to test for them unless the job specifications are properly made, and men are placed according to their abilities to work effectively.

Undoubtedly something can be done properly to place men of differing abilities on jobs requiring different capacities if the problem is faced with the idea in mind of properly fitting the man to the job. Whatever techniques are used, however, it must always be kept in mind that proper attitudes and interests, as well as mental and physical fitness and skills, must be considered in picking a safe indi-

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vidual for every activity, and providing an activity in which the specific individual may be comparatively safe because he best fits that activity.

Safety Instruction Adapted to Ability.—Thus far in this discussion the emphasis has been on the relation of ability to accidents and the need for proper placement of men according to ability in order that they may be safe at their tasks. It is also important that the relationship of ability to safety instruction be pointed out.

All too often zealous safety directors and supervisors try to present their instruction in the form of complicated relationships to the man who can understand only simple relationships. They talk in abstract terms which they understand and which are inspirational and promote their own enthusiasm, all of which is very good, for they must be enthusiastic. However, some men do not have the mental ability to grasp the meaning of abstract terms and so are not nearly so enthusiastic as one might think they ought to be, simply because they do not understand.

The problem is to find out how to meet men on a level of their ability to understand. Just because a fellow does not have the ability to paraphrase the poetry of the speaker at the glorious safety meeting is no sign that he doesn't want to live; and that safety meeting is not so glorious and the poetry is only hollow form if it doesn't touch right down on the spot of that interest to live in terms understandable to the fellow who has that interest. It is time that the man down on the production line be con-

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sidered. Until safety instruction is adapted to his ability, he will not be instructed. He will only wonder why the instructor is so far away from him. He may pay him due respect because he is said to be good by those who are "in the know," but he won't learn safety.

The man without the mental or physical ability to operate a machine cannot learn to operate it safely. It is futile to instruct a man on all the safe practices connected with the operation of a punch press, if he does not have the ability to operate one.

Thus it is evident that safety instruction should be adapted to the ability level of those to be taught, as concerns their mental capacities, their aptitudes and skills, and their physical fitness and ability.

CHAPTER X

TRAINING FOR SAFETY

Good safety supervision presupposes adequate training for the new worker and for the worker of long service who is shifted to a new job. This training must be given in several areas. The workman should be taught the correct and safe methods of effective operation or performance on the job to which he is assigned. He should also be trained in the general safe conduct in the plant. A third area in which training should be given concerns his life outside the plant. The supervisor may not seem to be responsible for this area. Actually he is, for a man killed or injured in a home or traffic accident is lost to the department. The costs of replacing him and developing skills in a new man are just as high as if the accident had occurred in the plant.

To do a good job of training men in safe practices, the supervisor should understand the relationship of intelligence to ability or capacity to take instruction. Next, he should develop the ability to instruct each individual according to his ability and capacity both to learn and to perform the task.

Plan the Safety Training.—In any form of training, results may be attained much more quickly

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when there is a definite plan rather than a hit-or-miss procedure. The usual reaction of most people when they face for the first time the grave necessity for safety training, is to say that everything is important. They offer more than others can absorb and through their misguided enthusiasm antagonize the very people whose cooperation they must have. No one person can cure all the ills of the world at once. In safety work, as in other activities, the field must be delimited and defined and the approach planned.

The following is an example of a plan for safety training which was successfully used by one foreman:

I. Job analysis and specification.

1. Make a new analysis of the job to be taught,
 - a. To discover details that form the subject matter to be taught. Note these items.
 - b. To designate specific hazards to be guarded against.
 - c. To designate specific correct and safe practices of operation and work method to be taught.
2. Draw up a job specification,
 - a. To show what skills are required for safe operation.
 - b. To show what special abilities are demanded.

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- c. To show what interests, attitudes, and other human elements, such as emotional control, are demanded by the job.
- II. Complete study of the qualifications of the individual.
 - 1. Past record.
 - 2. Personal qualifications, such as intelligence, emotional control, and attitudes.
 - 3. Skills that fit the job.
 - 4. List of items in which the individual is lacking and must be trained.
- III. Plan of procedure.
 - 1. List the items to be taught in order of importance.
 - 2. Limit the items to be taught to the time required to teach them and the total time available.
 - 3. Prepare the learner by establishing good relations.
 - 4. Prepare the instructor as to
 - a. Personal attitude toward the learner.
 - b. Personal attitude toward safety.
 - c. Details of how each point discovered in the job analysis shall be presented.
 - d. Knowledge and practice of best methods of teaching the specific individual.
 - 5. Prepare the subject matter so that it will be
 - a. Interesting to the learner.

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b. Practical in application.

c. In accord with best safety methods.

IV. Follow-up.

1. Put the learner through the paces of the job under careful observation.
2. Keep the learner at ease.
3. Stop unsafe practices at once.
4. Substitute the correct method—use the positive approach.
5. Review the worker at regular intervals.

The above plan is by no means complete in detail, but it served the purpose well. The foreman who used it became noted for his ability to train men, not only in safety, but also in all of the areas of effective production. The point of vital importance is that there be a plan and that the plan be followed.

By all means make your plan for safety training broad enough to include the job to be taught, the man who is to be trained, and yourself, as the supervisor, who is to do the training. However, when you make the plan inclusive, also make it definite in detail as to what the job demands, what to teach the worker and how to teach it, and what you must do to get safe practice across to the one you train.

Why We Fail to Learn.—An individual may fail to learn acts of skill or safe practices for several reasons: because of improper attitudes on his own part, because he lacks native capacity, or because the method of teaching is not the right one for him.

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Improper Attitudes.—The individual may fail to learn safety because of improper attitudes growing out of lack of respect for his instructor or supervisor, because of grievances against the supervisor or organization in general, because of fear of his superiors, and because of the insecurity in his position.

Lack of Respect.—We just do not learn much from those whom we fail to respect, unless it is more disrespect for them.

In the teaching of safety, we often fail because of the lack of respect on the part of those whom we try to teach, for our subject and for ourselves. The subject must be made respectable and the one teaching it must be respectable to gain respect and thus set the scene for proper attitudes which have much to do with the learning of any idea or practice.

Grievances.—Improper attitudes may also be due to grievances held by the worker against his foreman, the management in general, or the company.

A grievance is a state of mind rather than an actual condition of existing material objects. The conditions may form the basis for the state of mind on some occasions. Usually, however, the grievance is basically a lack of understanding on the part of the person holding it.

The lack of understanding may be due to failure to know policies, or to understand reasons for certain procedures, or lack of knowledge of the limitations of the supervisor, the company, or the organization. Every man has the right to know the company,

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organization, and group policies that affect him directly.

. Misunderstanding is often due to the poor personal relationship existing between a supervisor and his men. On the basis of such misunderstanding, men magnify otherwise insignificant trifles into insurmountable barriers which keep them from doing their jobs efficiently and safely. A grievance against the one in authority, whom they thus dislike, is generated in their minds.

Such individuals do not follow instructions, do not cooperate in the performance of their tasks, and do not accept willingly the promotion of ideas for safe or efficient practices.

Fear of Supervisor.—The supervisor who rules his men through fear is usually capable of teaching them only two things: more fear and greater disrespect. In either case they do not tend to learn safe practices or efficient methods of work.

There occurred a series of accidents in a department in a steel mill, most of which were minor injury cases. An investigation was made. The foreman was very strict; all safety rules had been fully explained and all men had been commanded to obey them. There seemed to be no reason why so many accidents should occur. The safety director was about to give up and hope that things would go better. Then, one of the older men in the department offered a suggestion. He said, "Most of these men are so afraid of the boss that they just work

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under such a tension that they are sure to get into trouble."

The safety director investigated this new angle and found that the foreman was a much-feared taskmaster. The men followed to the letter his instruction on specific safe practices and failed to learn the larger concept of safety-mindedness. They did not get killed, but they did have a high rate of minor accidents, which the violent instruction in specific cases did not seem to cover.

The foreman was taken into confidence. He was good at heart and did not wish his men to fear him. He was willing to cooperate. Under some careful guidance from the safety director and by the helpful suggestions of the men in the department, a better personal relationship was established between the foreman and his men. The accident rate decreased almost immediately as the men changed their attitude from fear to respect for the "boss" who had had a "change of heart."

Insecurity of Job.—When asked what he considered is the greatest single factor interfering with the learning of safety, the safety director of a glass manufacturing plant replied, "In my plant, at present, insecurity of the job."

He went on to indicate that even the brilliant fellows in the plant just didn't seem to grasp the instruction when they were expecting a layoff. Further, the men who were working were often so anxious to make good that they threw caution to the wind and took all manner of chances. His unofficial

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statement was that with a 50 per cent decrease in production there was approximately a 30 per cent increase in the accident rate in proportion to the number of man-hours worked.

When men are insecure in their jobs, they just do not seem to have the same interest, either in the efficiency or safety of production, that they have when work is steady and the job is secure. This makes the task of safety instruction all the more difficult when such conditions prevail.

Thus, improper attitudes arising out of fear, insecurity, lack of respect, grievances, etc., cause men to fail to learn safe and effective methods of doing their tasks and throw an added burden on the supervisor who must change these attitudes before his instruction becomes effective.

Lack of Native Capacity.—The individual who lacks native capacity does not grasp instruction so readily as the more intelligent person. His background is not so varied or rich; his experiences are not so divergent or ramified; and his ability to see complicated relationships is not so great. Because of these facts he cannot learn so rapidly as the person of greater intelligence or mental alertness.

For some years now, it has been recognized in the schools that some pupils are more capable of learning than others. In one school system, noted for its effective instruction, the pupils are segregated for instruction on the basis of intelligence levels. The Red group does approximately a third more work in each subject than the White group and nearly three

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times as much as the Blue group. The quality of the work is also approximately in the same proportions.

In such a system there is due recognition of the fact that pupils of lower intelligence learn less and learn less rapidly than those of higher intelligence. The teaching is fitted to the capacity of the learner, and the fact is admitted that those of lower capacity will accomplish less than the others in a given time, but all are instructed to the highest degree possible for them.

The time has arrived when, in all areas of life, the fact of differences in individual capacities must be recognized. The training of a man to produce efficiently or safely is a learning problem as much as is the training of pupils in school. It is time that industrial instructors recognize the capacities of their students and realize that some men fail to learn what is expected of them because their native capacity is low.

Improper Methods of Teaching.—The person of higher intelligence not only learns more, but retains what he learns longer than the one of lower intelligence. The person of higher intelligence may grasp safety teaching from lectures, discussions, posters, etc. The other man will probably have to be shown by actual demonstration and guided practice just what he is to do.

In discussion with seventy-five safety directors and instructors, representing some of the major industries in the Pittsburgh district, the fact was

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clearly brought out that the problem of adapting the instruction to the individual's intelligence is one of the major problems of safety education. It was evident to this group that the men who most need instruction are the most difficult to instruct. Almost any method is sufficient for the intelligent individuals, if only you keep at it. However, those who are not so intelligent must be instructed by special methods suitable to their level and usually to the individual.

Perhaps the same precautions should be taken to instruct people in the important field of safety that many schools are now using in dealing with the pupils of different intelligence levels as regards other subjects. Practically all elementary schools now have work graded to the separate age levels; many have the various levels of capacity segregated within each year. In most cases in industrial, traffic, farm, home, and public safety, all people are treated and taught as if they were of the same native ability. This is undoubtedly a mistake if good results are expected.

Every area of life is now faced with the problem of discovering the capacities of the individual and fitting the instruction to the individuals in such a way that they can profit by it.

Probably very few people would expect an eight-to twelve-year-old boy to handle a high-powered rifle safely under the simple instructions that he should be careful with it. Neither would they permit the same boy to operate a high-pressure

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boiler or a blanking press, after reading the instructions posted for its operation. These tasks might be physically too difficult. On the other hand, even if they were not physically too difficult, the assumption is that the child lacks both experience and intelligence to perform such tasks safely.

Yet it is true that we have many men in industry who are in the range of intelligence of the twelve-year-old child. They have no more native ability than the child, and, in spite of their years, very little more actual and usable experience. However, they are given the same type of instruction as those of greater capacity and are somehow expected to work safely.

If it were found necessary to have the child do the tasks mentioned, certainly he should be given very explicit and carefully planned instruction. Every effort should be made to suit the instruction to his capacity to grasp it. He should be watched carefully and every faulty detail of his behavior quickly and considerately corrected. Not so with the thirty-year-old man who has no more ability than the ten-year-old child. If the man succeeds without accident, nothing is said; if the child succeeds, he is praised because we did not expect it of him. If the child makes errors in his procedure, yet another way is found to instruct him; if the man makes the same errors, he is called a hopeless *dummy*. The two are equal in intelligence and each should be given the same considerate instruction, understandable to him, if he is expected to do the task.

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A teacher once said to another who taught a special group of low intelligence pupils, "What a dumb bunch that is!"

The answer was, "They are what they are and I am the dumb one if I fail to find a way to teach each of them something, and some things to each of them. It takes more time, more patience, and more effort to teach this group than one of average intelligence, but it is worth all that extra effort if one but finds the way."

Sometimes the safety instructor is at fault rather than his pupils. They are what they are, and he must find ways to teach something to each of them even though it requires special methods, more time, more patience, and more effort for some than for others.

If improper methods of teaching are used, little learning will take place in the direction hoped for by the instructor. The proper or the right method is always the way that best gets the point across for each individual. It may be given as a general rule that those of lower intelligence require more individual attention, more demonstration, and more of actual practices. Demands are made for more understanding of their background, more patience, more time, and more reward for success than for others.

Adapting Safety Instruction to Intelligence.—Safety instruction must be adapted to the level of intelligence of the one being instructed. This means that the average foreman must make his instruction

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fit a level of intelligence below his own. By no means are all foremen individually more intelligent than each of the men they supervise. In fact, in very few cases is the instructor the most intelligent individual in the group. However, the average level of intelligence of the supervisors in a large industrial plant has been found to be slightly above the average level of the intelligence of all the men they supervise. The same progression holds true when the intelligence of the safety directors of a group of industries is compared with the intelligence rating of the foremen.

In this lies a grave danger. Safety directors tend to plan safety instruction on the level that challenges their capacity and fits the background of their experience. They thrust their plan upon foremen who do not understand it sufficiently to give it interested support. Likewise, the foreman gives his instruction against the background of his experience and in a way understandable to himself, but not to the man whom he instructs.

"The safety instructor devised a beautiful plan of which he was so proud, but in spite of all his hard work there were as many accidents as ever before." This is not an uncommon situation. The plan and hard work will go for naught unless the ability of the persons who are to put it into effect is considered. They must understand it; it must be interesting to them; it must be meaningful and vital to them. If it is, it will work.

The average mental alertness for the general pop-

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ulation is equal to that of the average seventeen- or eighteen-year-old. Some people are much higher and some much lower in mental capacity.

Tests for mental alertness were given to several thousand employees in an industrial plant. The median score was at fifteen years; the range was from seven and a half years to almost a perfect score on the test, but 83 per cent fell between the ages of thirteen and seventeen years mentally. In this plant safety instruction is adapted to only one level, which is beyond the capacity of the majority of the workers.

This plant is a typical organization in a large industrialized community. Therefore, the assumption may be made that the intelligence level of most industrial workers is indicated by this investigation. If this is true, there is no doubt that most of the well-planned safety instruction goes *over the heads* of those for whom it is intended. Safety plans have been the pride of those who made them, but they are often just too good and too far out of reach for those for whom they are intended.

It behooves safety directors, instructors, foremen, and safety leaders in all fields to find out what the men and women whose safety they hope to promote can and will understand. It would be well to forget some of the beautiful schemes that do not work, and substitute some simple measures that really work.

It is not sufficient, however, to recognize the average level of intelligence and teach on the basis of

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that level only. There are many individuals who are below average intelligence and require specific attention.

One foreman had the correct idea. After he had instructed the men in his department at the regular safety meetings of the department, he always called John aside the next day and asked him for his own suggestions on safety. Thus without embarrassing John, he found out how much the man had missed and what he had learned. He then individually instructed John and developed in him a pride in the fact that he was an important member of the department. All the others did not need this special attention, but John was very dull and he had to be taught separately. The interesting thing is that that foreman had maintained a perfect safety record for three years and he got "a real kick" out of doing it.

"Oh, well, maybe John wouldn't have had an accident anyway," some one will comment. That may be true, but the added good will and the fine attitude developed on the part of the dull fellow, and the good personal relationship between the foreman and all his men were certainly conducive to more effective performance, both in efficiency and safety on the job. It is better to give special attention to these specific cases than to live in hopes that nothing evil will happen. There has been too much wishful thinking to take the place of honest effort in this whole problem of safety. It is now time to plan

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carefully how to instruct every individual to the best advantage.

If safety is to be promoted effectively, it is necessary for the promoter to adapt his instructions to various levels. He must teach each man as an individual. He may not have the time to go into explicit detail with every man; for some, it is unnecessary. He must assume that most of his men will grasp his general instruction. On the other hand, he must know their individual capacities to learn what he is attempting to teach them, and fit his instruction to his students.

Low intelligence may be an important factor in causing accidents; but it is a far more important factor in the learning of safe practices. It is probably true that most of the safety directors, instructors, and supervisors are of a slightly higher level of intelligence than the general average of those whom they must instruct. Owing to this fact, they are apt to make the false assumption that what is understandable to them is also equally understandable to those working under their supervision. Remember that the average industrial worker has a vocabulary of approximately 1,000 words, the foreman two or three times that number, and top executives about seven or eight times as many. This indicates that verbal instruction must be given within a very restricted range. It is not uncommon to hear a foreman in industry or a teacher in a school say that certain of his group are dumb when they do not follow his instructions. Quite often the

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thing that the instructor does not realize is that he has failed to give the instructions in words and terms that others could understand. The instruction is too often given against the background and on the level of ability of the instructor, rather than against the background or on the level of ability of the one being instructed.

Sometimes this seeming dumbness on the part of others is due to inexperience or lack of knowledge in regard to specific problems. However, in other cases it is due to low intelligence or mental dullness. In such cases not only is there a failure to understand the instruction as given, but the person fails to build a meaningful background from his experiences, against which he could understand even a less complicated type of instruction.

The thing to be remembered in instructing any individual is that the instruction must be meaningful to him. Although time scarcely allows the instructor to find what is meaningful to each and every individual, it is possible to assume that individuals, within a given range of mental capacity and exposed to a certain group of facts, will grasp about equally the material presented. The material must be pitched to the range of the group.

Material to be learned may be out of range for the learner, either because it does not fit the facts of his experience, or because it is too abstract and complicated in its structure to be meaningful to him. All instruction in safety should be given in simple terms fitted to the background of experience and

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within the range of intelligence of the one receiving instruction.

The Supervisor's Responsibility.—The man who is dangerous because he doesn't know or because he lacks experience places a responsibility upon the supervisor. This responsibility is divided into three parts:

1. To train him in the safe practices.
2. To inform him.
3. To place him, wherever possible, on a job which he is capable of doing safely.

Training in Safe Practices.—It is the responsibility of every supervisor to know his jobs thoroughly enough so that he can train his men to perform them efficiently and safely. This, of course, requires that he make an analysis of the job and of the human qualities necessary to do it. Too many foremen are prone to say that the industrial engineers have made job analyses and specifications and that, therefore, they need not do so.

The industrial engineer's analysis was made for a different purpose than the selection and training of men. His analysis is usually made with the idea in mind of setting rates on the jobs analyzed. That analysis is available to the engineering department and to the supervisor of a department on such occasion as the resetting of rates in his department. The analysis thus made often does not cover the very factors that the supervisor must know concerning the job in order to train men effectively.

Therefore, the departmental supervisor must

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make his own analysis of each job, keeping in mind the human factors that enter into it. One excellent foreman follows this procedure:

1. He takes the industrial engineer's analysis and studies it carefully.

2. He makes a second analysis, including the specific efficient and safe practices required on the job.

3. He draws up a specification chart of the human qualities such as physical strength, health, interest, attitude, skill, intelligence, and emotional stability required on the specific job.

4. He studies the individual who is to do the job to see whether he has the qualifications, and to find where his teaching and training are required.

5. He proceeds to train the men to fit the job effectively.

6. He returns the results of his findings to both personnel and industrial engineering departments. This foreman has not only a good safety record, but his departmental costs are low, and there is an exceptionally high state of morale in the department.

The training program of a supervisor must include not only the specific job but also the general conduct of the life of the employee. He must be safe not only while operating his machine, but also about the plant, and even at home. After all, the loss of an employee through accident at home is just as serious, except for compensation payment, as the loss of one on the job. The labor turnover cost is just as high.

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Placement of Workers for Safety.—Every man is not capable of doing every job safely. Even though the supervisor exercises every intelligent effort to inform and train a man, he may still be unable to do the job safely. Some men lack intelligence, some lack motor ability, or interest, or proper attitudes to do some jobs well. No amount of training, no matter how well planned, can suffice to safeguard some men on some jobs.

To meet the problem of lack of knowledge, which cannot be supplied because the native capacity is too low, men must be properly selected for the specific jobs. Many personnel departments are aware of this fact and are making an attempt to meet the problem.

The final responsibility, however, lies with the supervisor in charge. A personnel man cannot always guess what the job requirements are or what kind of man will best fit a given job, unless he is enlightened by the supervisors who have charge of the job. All too often the foremen condemn the personnel department for sending out the wrong man for their requirements.

The problem of selection is complicated by the fact that it is common practice to move men from one job to another by seniority. Until both management and labor organizations recognize the fact that a *qualified seniority* is for the best interest of all concerned and do something to promote that idea, the problem of correct placement will remain difficult to solve.

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Seniority is now being qualified in many industries by careful rating of the employees. Where this is done in good faith and honesty, there is, after the first reaction against it, usually an acceptance of the idea by labor. The rating and the records otherwise obtained by the personnel department, such as specific abilities, interests, etc., along with special reports to the foreman, all taken together may be used to indicate the worker's ability to do a given job. Then the man with the best combination of qualifications and length of service—each properly weighted—may be taken for the job.

Enlightened labor leaders, as well as many of the workers, are definitely interested in promoting the idea of qualified seniority. Until this problem is solved, many men will be promoted by straight seniority to jobs that they may not be capable of doing and may not be capable of learning to do. In that case what they lack in knowledge must of necessity throw an extra burden upon the supervisor. He must spend more time and effort to give them the necessary training. If this cannot be done, he must find some way of carrying part of the load of the ineffective man by closer supervision and assistance on the job.

Many times the tasks within a department and within a job classification are varied enough so that, without violating the limits placed upon him, the foreman may place men where they best fit. Where this is possible, it should be done in the interest of efficiency and safety.

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The foreman of the maintenance department of a certain mill found that one of his men could never work safely at roof repair jobs. He spent most of his time grasping the line attached to his safety belt and hit his fingers with the hammer often. He was afraid on the roof, and no amount of information or instruction seemed to remove the fear. Yet he was a willing and a good worker. He asked to do extra work for other men on the crew, if only he could be excused from work on the roof. He was not guilty of malingering, he was just unsafe on roofing work and he knew it. The foreman found plenty for him to do on other jobs, and he became in the foreman's words, "My best man, but to put him on a roof just means inviting an accident to happen." Here proper placement has avoided considerable trouble. The man was placed at tasks that he knew how to do and where he had no fear.

Two Types of Training.—Two types of training are required for each new employee or old employee. He must be given general training to acquaint him with the plant as a whole and specific training to fit him for his specific department and job.

General Training.—General training should include his duties and privileges on such items as plant safety policies, hospital and safety equipment, accident reporting, and safe conduct at work and away from it.

Most industries have definite safety policies and safety rules and each new man has a right to know them. Many plants give the new employee a little

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handbook containing those rules and policies. It is not enough just to hand out the booklet. The attention of the man should be called to it. It is well to inquire of him in a day or two if he has read it, or even to go over it with him, prepared to answer the questions that he may be led to ask. Thus much information can be given the new employee which he would otherwise overlook.

The general training should include a trip to the hospital to make the employee familiar with its location. He should be introduced to the doctor and attendants and made to feel that the hospital is there for his benefit and convenience.

Safety equipment such as belts, goggles, first-aid equipment, etc., should be shown and demonstrated.

Accident reports are required in practically all industrial plants; many have standard forms and standard procedure for reporting accidents. Every accident, no matter how slight, should be reported, and every man should be trained concerning what his duties are in this matter.

The minor accident should be reported. The scratch may become serious enough to cause loss of time or even death. Men should be made aware of the fact that they are expected to report all injuries and accidents, and that they will not be considered as "sissies" for doing so. Men do not guess these things, they must be told what to do and how to do it in the case of accident reporting. They must be informed as to the attitude of their supervisors and management, otherwise they will not

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know and may foolishly keep to themselves the very information that management wishes most in its campaign for safety.

Specific Training.—The general training is not sufficient. Each job, because of its nature, has certain points on which the new man should be informed. He should be given information and training for his own department and his individual job. Quite often there are special departmental policies over and above the general plant policies and rules. He should know these.

Each job can be done in a best way. That best way is also the safe way. The man does not always, in fact rarely does, know that best way. He should be told, shown, and put through the paces of safe practice on his individual job. Other things being equal, the well-trained man is the safe man on the job; the man who does not know is dangerous.

Safety Training and Job Position.—If men are properly placed after careful job analysis and thorough checking of their qualifications against the analysis and specification of the job, it is possible to fit the safety instruction to the task or position. In any case each type of task requires a definite set of safety instructions to cover the specific details peculiar to it.

In many fields, job analyses and specifications are made. However, few of them have gone so far as to include the human elements of attitude, interest, specific abilities, intelligence, etc., necessary to safe performance. Most of the analyses have been made

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by engineers on the basis of the engineering assumption that too often makes of this world an array of *things* to be made and to be moved, rather than a world in which the human being is the most important creation as far as we humans know. The mistake must not be made of going to the opposite extreme. It is necessary that someone or some group make the kind of analyses of jobs and specifications of human qualities to fit those jobs, which denies neither the engineering nor the human assumptions entirely but organizes the best from both into an effective working assumption.

If and when the selection and placement are scientifically made, including the human as well as the engineering factors, the instruction on each job will be necessary; but it will be the more effective, with less effort on the part of the instructor, for there will not be such a wide divergence of mental capacity, special abilities and aptitudes, attitudes, and interests on the part of those doing a definite kind of job.

However, never let the assumption be made that, even with highly scientific selection and placement, the supervisor can escape the necessity of fitting his instruction to the capacities and peculiarities of each individual whom he trains.

CHAPTER XI

EMOTION AND SAFETY

Emotions are definitely related to safety in two ways. First, the individual under the stress of an emotional disturbance is less likely to follow safe practice. Second, supervision and instruction are more difficult when either the workman or the supervisor is emotional. It is the responsibility of the supervisor to regulate the scene so that emotions are properly controlled; complete elimination of them is impossible and undesirable. Emotions properly controlled and directed may be used to great advantage at times in the promotion of safe practices and on the general safety program.

What Is the Nature of an Emotion?—When a person is prepared to meet the situation, there is rarely an emotion. But when there is no ready pattern of action to fit the situation, an emergency exists. When enough of the body becomes involved in meeting this emergency, the individual becomes emotional. He may become angry or frightened, or he may just be excited and confused.

The emotion may be due to past experiences or the extreme confusion of the present situation. Many times the background of a man's experience

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is such that a careless or unkind remark will cause him to become angry or excited. The same remark may be passed off as a joke or go unnoticed by other people. There need not be unhappy or distressing experiences in the background to arouse an emotion if the present situation is very annoying or confusing. In this case the very fact that the person does not have a quick way to adjust himself will be sufficient to cause the emotion.

A man who had been working at what is generally considered a dangerous job was transferred to a job in the open-hearth department of a steel mill. He had never been in a steel mill before. He was so frightened the first day that he could not eat. He wanted to quit his job. Now he is a foreman in the department and does not feel the least emotion concerning the things that once put him into a state of extreme emotion. He says he has got used to it. What has happened is that he has a definite way of reacting to the things that caused the confusion on the first day. At that time he ran into an iron post as he tried to get away from the shower of sparks when a heat was tapped. Now he peers into the ladle through his blue glasses entirely unafraid but respectful of the true hazards of his job. At that time he was emotional because he knew no other way of reacting. He was unsafe because he was likely to do anything, safe or unsafe. Now, he has a set pattern of reaction to his surroundings and he is not emotional, nor is he likely to be unsafe because of confused actions.

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Some emotions cause secondary conditions to arise as a result of what is done under the stress of the emotion. These secondary conditions may be either annoying or satisfying. If they are annoying, the individual quite often learns to avoid the conditions that cause the original emotion. If the secondary conditions are satisfying, he may learn to promote the conditions and situations that cause the original emotion. Thus, the man who endangers his life by taking chances may arouse in himself an emotion of fear; he may also get a tremendous amount of satisfaction out of the praise he gets from others on the way he performed to escape the specific situation of which he was afraid. If the satisfaction is great enough, he may attempt the dangerous practice again. A man may handle himself well in a fist fight when he is very angry. He does things that will arouse his anger so that he can fight and in turn reap the satisfaction of having his friends praise his ability at fist swinging. The angry "show-off" in the factory often plays for the satisfying attention he can command.

When something happens that cannot be taken care of by the usual reaction of the skeletal muscles, the nerve impulses begin to spread through the body until a way is found to get rid of the difficulty. If this spreading of nerve impulses is great enough in extent, heart action, blood pressure, breathing, digestion, etc., are affected. The individual must escape from or remove the difficulty and the whole body will be used if necessary. When the nerve im-

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pulses reach the autonomic nerve centers, the glands and internal muscles prepare the body for drastic action to meet the emergency which was not handled by the skeletal muscles because there was no well-organized habit to deal with the situation. As soon as the internal and external physiological activities just described are recognized by the individual, he becomes aware of the disrupted condition, and, relating them back to their causes, he also becomes aware of an emotion which is classified according to the nature of the situation that caused it. He is angry at a foreman who calls him names, or he is afraid of losing his job when he makes a mistake.

A point to be remembered is that an emotion is the result of a disorganization of learned habits of action which were inadequate to remove the cause. More than that, not only the habits and learned patterns of action related to the specific situation are disrupted but also other activities are interfered with. The man who uses a hammer or tries to operate a punch press or a lathe under the stress of emotional anger at his foreman is in danger of unsafe practice because of the disorganization of the pattern of activity of such operation.

When there are no patterns of activity belonging to the veneer of civilization available to remove the trouble, the individual reverts to the more primitive reactions which at one time were necessary to keep man alive. Such reactions may be highly dangerous in a world of objects and activities created by man and require specific superimposed and learned habits

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to deal with them safely. Primitive reactions of fearful running or angry fighting would scarcely stand one in good stead in the traffic of a modern city or in the complicated setup of a large industrial plant.

Effect of Emotion on Safe Practice.—Since energy is directed into the channel of removing the difficulty causing the emotion, most of the usual patterns of activity are disrupted during an emotion. Most of the safe practices of industry, traffic, and other areas of life are learned habit patterns. Thus, the emotion disrupting these learned habit patterns causes also a disruption of the safe practices.

Acts of precision and skill are usually refined and special habit patterns which may remain quite stable under favorable conditions. However, under the stress of an emotion they are broken up and the energy of the body goes into the channels that promote either rapid escape or brute attack on machines, material, or other men. The large-muscle groups become more active and the specific muscles required for precision work are forced to cooperate in urgent demands of crude action. Thus, under the stress of emotion, such a precise job as placing a hairspring in a watch is very difficult. The muscles that control the activity of the whole arm are more likely to be playing a dominant role than those that control the fingers. Every special pattern of activity gives way until the body meets the emergency that aroused the emotion.

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Under emotional stress material is spoiled and accidents caused because the pattern of activity necessary to perform safely and efficiently at a specific job is disrupted. The energy of the organism is focused on any method the body may have found to remove the difficulty causing the emotion. The method found is not always the safe one. In fact, it is usually unguarded and violent activity.

When the scene is set for an emotion, reasoning usually will not help. At such times thinking and reasoning are directed into the channel of activity to eliminate the cause of the emotion. This results in a disregard for safe methods and unguarded activity follows. Even the language used and the tone of voice are usually unguarded at the time of an emotion. It is not fully correct to say that one does not think under emotional stress. It is probably more correct to say that his thinking will follow channels that tend to eliminate the cause of the emotion by means of extreme activity.

Under such conditions of unguarded thinking, speaking, and activity, the individual becomes quite unsafe in most of the complicated activities of life which demand carefully learned patterns of action. The activity during an emotion is not so much confused as it is definitely extreme in either the direction of attack or escape. Such extreme activity is almost certain to result in disaster in most of the situations of present-day life.

The little boy who is in a rage because the boy across the street is calling him names rushes to the

attack. So much of his energy and thought is directed into the channel of this activity that he does not think to observe the traffic conditions. He is likely to rush directly into the path of an automobile. The workman who is angry or fearful or anxious is also likely to do things that end in disaster.

Safe Practice Cannot Be Learned under the Stress of Emotion.—During emotional stress special learning is reduced to a minimum. Learning follows attention. The attention is directed to the gross activities of escape or attack. Thus there is little chance that ideas of specific safe practice will be learned under the stress of an emotion. What learning does take place will likely interfere with rather than promote specific safe practice. One may learn how to fight better or escape more quickly but the better knowledge of how to fight or run is of little value in handling a truck, crane, punch press, or milling machine.

To learn safe practices, the attention must be directed to the safe practices that the workman is expected to learn. If he is the victim of an emotion, it is almost impossible to direct his attention to anything other than to a means of removing or escaping from the thing that causes the emotion. He must be calmed down before you can teach him safe practice.

In any attempt to teach safe practice, the attention should be directed to that matter rather than to situations that arouse emotions and defeat the

learning of the safe practice. If the attention is directed to the emotion, the very habit of emotionality becomes fixed. Such emotionality usually does not lead to safe performance.

Not only are unsafe practices likely to be more prevalent during times of emotion, but they are likely to become fixed because of the extreme effectiveness of the activity upon the person. The unsafe practice becomes a part of the pattern of the general escape from or attack upon the things causing the emotion. Any subsequent stimulation in the same direction is likely then to cause, not only the recurrence of the emotional activity, but also the recurrence of the unsafe practice. Thus, the worker should be relieved of emotional tensions if safe practices are to be taught effectively.

Angry or Excited Supervisors Cannot Instruct Others.—The individual under the stress of emotion rarely learns safe practices. It may also be said that one under the stress of emotion rarely teaches safe practices. His ideas and demonstrations are not likely to be clear or correct. He tends to set up an emotional state in those he attempts to instruct.

A young training director in a certain industrial plant was very emotionally excited over the "ribbing" he received due to his forthcoming marriage. He confessed that he taught an entirely wrong method to a group of apprentices but added the hope that his presentation was so confused that they would not understand it anyway. He taught the same lesson over with some semblance of correct-

ness and clarity a month after his marriage. He found that most of the boys had not understood him the first time. However, several had to be corrected for they had actually learned the wrong method. Clarity of presentation is not often accomplished under excitement. The forcefulness of the emotional presentation too often directs attention to the wrong things. It requires clear thinking and careful planning to present the safest and best way of doing a thing. Emotionalism disrupts the presentation and confusion of thinking results.

Those who are being instructed are often stimulated by the emotional state of the instructor, or by something he says or does in the unguarded condition of his emotion, to also become emotional. Under such conditions general confusion is usually the result. To teach safety to others you must help them to control their emotions, do nothing to arouse emotional stress, and control your own emotions. You cannot teach others to follow safe practices when you are excited, angry, or confused.

Use of Emotional Appeal in Promoting Safety.—To say that all emotion is evil would be both foolish and incorrect. We have gone to some length to point out how emotional stress usually interferes with both safe practice and the teaching of safe practice. It is possible to use controlled emotions in the promotion and support of safety. Every idea may be given an emotional appeal. The idea may so be presented that the attendant emotion can be released best by the acceptance of the idea. The

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successful promoters of most causes have used this method. In fact, most ideas that are accepted are given an emotional appeal. Even the idea that accepting a given religious creed or belief other than the one already held is usually promoted by arousing emotions that are released by the acceptance of the idea of the promoter.

Care must be exercised in the use of emotional appeal to avoid an emotion being formed against the idea you wish to promote. We may find in promoting safety that emotions are tricky tools which sometimes cut in the wrong direction. Unless you are sure you know how to use and control emotions, the best advice is to avoid attempts to arouse them. Keep on presenting and working diligently by the more slow, but more sure, methods to promote your ideas of safety.

If you are going to use emotions to develop the idea of safety, be sure that the emotion is released by the acceptance of the idea of following safe practices. Never build an emotion to the degree that it remains a disrupting influence in the activity on the job. The extent of the emotion should be limited and its direction controlled. Never let it get out of hand or go in the wrong direction.

One safety director hoped to arouse the anger of a group of men so that they would support a special safety promotion idea. Somewhere along the line the scheme bogged down. The anger was aroused and had to be released somehow. The director failed in his attempt to show that the acceptance

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of the promotion idea was the way to remove the tension causing the emotion. So the men released their anger by calling the safety director names and working against organized safety in the plant.

The emotion should be planned and the way of release also. Many supervisors have controlled and directed into proper channels the emotions of their men for the purpose of promoting the acceptance of ideas of safety and the desire to work safely and effectively. Use emotional appeal sparingly until you are sure you know how to direct and control the emotions you arouse in others. Then be sure that the emotion is released by the performance of the kind of activity that is desirable and that you wish to become fixed as safe habit.

Release of Emotional Energy.—When a man is stimulated to the extent that an emotion exists, there must be some release of the tensions set up by means of activity before he can return to a normal state of balance. This energy may be released through activity which is safe or unsafe. If the activity can be guided into channels of safe practice or the promotion of safety, the results of the emotion may be returned to a good end. More often the release of emotional energy is carried out in a random activity rather than in accord with any careful plan. When this is the case, the activity of release often leads to specific unsafe practices.

In planning the release of emotional energy, the supervisor is responsible for finding means that will not be attended by undesirable results as concerns

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safety. There is sometimes danger that the very method used to release emotional tensions fosters results as bad as those brought about by the emotion.

An order came to a department in an industrial plant stating that all men in the department would take two turns off a week until further notice. There was a great deal of distress and some anger exhibited on the part of the men. Some of them were extremely emotional. The foreman knew that something must be done to release this energy. He proceeded to get two of the boys interested in riding the crane chains. They were to have a little bout from their lofty positions. The other men were encouraged to cheer for one or the other of the two opponents. The crane operators were to manipulate the cranes to make it a good show. It all worked the way the foreman had anticipated. The emotional tension was released. Nobody was hurt. But, riding crane chains is a dangerous practice. There was a plant safety rule against it. The foreman won his immediate objective, which was to release an emotional tension, but he promoted an unsafe practice which he later had great difficulty in eliminating. There must have been some better way of releasing the tension.

Usually it is wise to remove the emotional individual from his specific task, if it is a hazardous one, until he has come back to normal. There are several things that may safely be done to release the energy built up under emotional stress. The

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method of catharsis is sometimes very effective. Simply stated the individual must get the stress out of his system both figuratively and physically. This can be accomplished by letting him "pop off."

The supervisor often does not like the idea, but a part of his job is to serve as a "safety valve" for the release of stresses and tensions of those whom he supervises. We all know how much better we feel when we can get a thing "off our chests." It can make no difference how unimportant the problem may be in the mind of the supervisor. If it is a problem that creates tension in the one who has it, it is a big and important problem. If it is not aired in the open it may generate more difficulty. No matter how trivial the problem may seem to the observer, it is important enough to deal with since the bad results from such unresolved tensions often far exceed the seeming importance of the original problem.

The supervisor who wisely becomes the "weeping post" or "safety valve" must be a sympathetic listener. He must listen until the man is once more calm and collected, at which time he may find that there is a fertile field for instruction in proper methods and even in means and methods of avoiding similar situations. If he would release the tensions of those who come to him, the supervisor must

Listen

Listen

LISTEN

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Invite and encourage the man to tell his story. Have him tell it over. It usually begins to lose its sting with the first telling. By the time he has told it a second or third time, he usually begins to apologize for having been so upset. If, however, the retelling seems to give more evidence of increased bitterness or anger, the supervisor would do well to mark carefully the accusations, for usually there is something definitely wrong in the scene to which he should have attended before it generated trouble.

In no case should the supervisor be hasty to arise in his own defense. If the man has a real problem, the supervisor should have it exposed so that he may clearly define it and discharge his responsibility in the matter. If the problem is chiefly imaginary, the exposure of it by the one who has it will usually end in an apology when he has relieved himself by telling his tale. In either case it is wise to listen sympathetically to the whole story.

The man in whom the stress and sting increase with the telling is usually exposing something that smacks of supervisory neglect and is thus performing a task that should cause the honest and alert supervisor to thank him and invite his cooperation in dealing with the now clarified problem. Such a man when approached in this way will not only release his own emotional stress but will render valuable aid in solving problems. He is also in a position, when he has calmed down, to receive instruction in safe practices and in the most effective methods of meeting his own personal problems.

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The man who gets all "steamed up" to high emotional pitch over minor problems or problems that do not arise from supervisory neglect usually calms down when he is allowed and invited to talk without opposition. When he has become calm and apologetically states that he was perhaps overwrought and too excited, he is in a good position to receive instruction in

1. The formation of better habits of emotional control.

2. The dangers of emotional states to himself and others.

3. The specific safe practices and the general relation of emotional control to his own personal safety.

A supervisor should not try to deny the statements of, or argue with, a man whom he has invited to come to talk out his troubles. If he does, the man goes out with the old grievance unsolved and a new emotional stress generated which make him doubly dangerous to himself and others. See the thing through to the end; let the cathartic work. In the majority of cases good results will be obtained. Of course, there will be a few who come just to grouse. They will return often. Do not be too rough with them until you are sure you have them properly classified. When you are definitely sure that all your responsibilities have been fulfilled and that the man is a chronic "griper," it may be necessary to "stop him up short" by disciplinary measures.

However, save this method until everything else has been tried.

Emotional Stability of Individual Must Be Considered.—Most individuals have fairly well-established patterns of emotional stability, which have been learned and become established as habits. They differ from individual to individual. It is possible to change these habit patterns, but it is not probable that they will be easily changed. The pattern becomes established rather early in life and is usually quite definitely fixed by the time an individual is engaged in adult activities. It may be wise to try to reform these habits but probably more wise to understand them for each individual and so set the scene to avoid difficulty for him.

One individual may be so emotionally stable in his pattern of habits that nothing except extreme situations will arouse him to an emotion. Another may be so unstable that the slightest variation from the usual may incite him to anger, rage, anxiety, or fear. It may be very difficult to correct such a habit pattern that has been firmly fixed since early childhood. It would, perhaps, be better to know the status of the individual as concerns his emotional stability and to adjust his activities in such a way that things that arouse the emotions will be avoided wherever possible.

The person who is emotionally unstable should be placed on the type of task where he will be safe. This may mean that the job does not offer many circumstances that will arouse his emotions, or it

may mean that the job is of such a nature that the individual under emotional stress may perform it without extreme danger to his own safety or that of others about him. The problem of the relation between emotional stability and selection and placement on the job is one that demands further study as concerns both efficiency and safety.

Safety Instruction Fitted to Emotional Level of the Individual.—The safety instruction should be fitted to the individual on the basis of both the job he performs and the level of his emotional stability. Certain things may be presented and certain methods used for some individuals which would only arouse emotional resentment in others. One foreman using very acceptable methods in safety instruction felt that he was not accomplishing anything with a certain member of the group. He discovered on investigation that he made this individual angry when he used the methods that were most effective for the others of the group. He decided to instruct the man individually. He was again unsuccessful, for the man cringed and was afraid and proceeded to cry tears and ask to be permitted to go. However, he submitted to a test for emotional stability and was found to be less stable than 98 per cent of the general population. On the job, the man was a good worker but had to be placed on a task where he was absolutely alone and left to develop his own activities, methods, and ideas. He could not be supervised. If the foreman even looked at his work, he would cry or swear and often stopped

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work altogether when anyone came near him. This was an unusually extreme case. However, between this extreme and the opposite end of the scale, most human beings are distributed. The method of instruction, to be effective, must take into consideration the level of emotional stability of those who are approached by the methods used. Methods that get the best results must be devised for different types of individuals.

The emotional stability of the instructor is an important factor in the instruction of others. His level of emotional stability sets the scene for the kind of instruction that he can give and the methods to be used. The material and methods he uses should be so controlled that his own emotions are not aroused and that he may present his ideas without the necessity of saying and doing things to save his own face.

The ideal situation is to pick instructors who are emotionally stable. However, this is not always possible. Every supervisor finds himself engaged as an instructor whether he wishes it or not. Therefore, he should have a good picture of himself so that he may adjust his teaching methods not only to the type of worker he instructs, but also to the type of person he himself is.

High-strung, nervous, excitable supervisors usually teach very little to their workmen besides the bad habits that they exhibit. The instructor of comparatively low emotional stability must prepare his material and plan his methods so thoroughly in

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advance that no disrupting situation with which he cannot cope will be likely to arise. Perhaps the very emotionally excitable supervisor should never use the argumentative free-discussion conference method of presenting material to his men lest he break down emotionally and become excited or angry during the discussion. However, such a method is often effective when handled by an instructor who can calmly cope with and control any turn the discussion may take. Know yourself, and then choose the method that you can best handle to get the points across to others effectively without arousing their resistance through emotional resentment of you or the idea you attempt to promote.

Modifying Emotional Patterns.—Since emotional stability is more likely a set of habit patterns, which have been learned rather than inherited, emotional stability may be modified. First, one may learn to know the kinds of situations that arouse excessive emotional stress and then may preplan to avoid such situations. This may seem like running away from the facts, but after all, it is sometimes expedient to run away from some tasks until proper plans are developed.

Second, one may develop, through preplanning and careful practice, definite habits of emotional control. If such habits are thoroughly established through long and exacting practice, the emotional instability is either overcome because the original habit pattern is eliminated or changed, or it is so covered by the overlying habit of control that the

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bad effects of the excessive emotional condition do not function.

The supervisor who attempts to teach safety then has the double job of setting the scene so that those he teaches will develop habits of emotional control, and of developing for himself the same type of habit. He quite often makes the error of assuming that the first of these tasks is his only responsibility and exhibits considerable lack of emotional control when those being taught do not respond as he had hoped. It is probably just as bad to show anger or excitement at the fact that another individual is angry or excited as it is for them to be so. Self-control must be established before the supervisor can control others; it is an important factor in the promotion of safe practice.

CHAPTER XII

THE MALADJUSTED WORKER

We have seen how some people are unsafe because of the lack of physical and mental abilities and the lack of knowledge. There are others who are unsafe because they are improperly adjusted. They are misfits in the world in which they live because they have not learned to adjust to that world as it is.

The question may be asked, "Who is maladjusted?" The answer may well be that most human beings have quirks in certain areas of their lives. However, most individuals, even with their minor maladjustments, are within the normal range. It is normal to be less than perfectly adjusted in some details of life. We are chiefly interested in two groups of maladjusted individuals in this discussion. First, we are interested in those who are so extremely out of step with their world that they are in need of constant watching. Second, we are interested in those who, although they are within the normal range, are sufficiently maladjusted in some area to demand our attention concerning their safety.

Types of Maladjustment as Factors in Accidents.
—There is very scant evidence of a statistical nature

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to show that maladjusted individuals are more prone to accidents than others. However, there is a wealth of evidence, from the experience of individual supervisors in industries and observers in other activities, to show that the maladjusted individual is more likely to have an accident than those who are not the victims of such difficulties. The man who is a show-off at work because he is "browbeaten" at home, is dangerous. The individual who is the victim of undue fears or worries just does not work efficiently or safely. Careful observation will substantiate the contention that maladjustment is an important factor in accident causation.

Extreme Types.—The maladjusted may be classified for our purpose into two groups—those who have formed minor bad habits and those who are extremely defective. Under the latter grouping are found the amented, the demented, and the manic-depressives.

The amented group are those who never had an ability sufficient to meet the world of normal beings successfully. They may range all the way from the unfortunate individuals born with important parts of the cortex of the brain lacking, to the individuals who are mentally too dull to adjust to a normal world. There is no way to give these individuals what nature has denied them.

The very lowest degree of amented individual usually does not live beyond early infancy and rarely presents a problem as concerns accidents in

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the normal world, because he is confined either to the very narrow range of his home under special care, or is placed in an institution. However, the dull individuals who range up near the border of normal mental ability are actively engaged in many occupations and activities of life. In industry the problem of dealing with these is to find routine jobs which are within the limits of the capacities of the individuals. In other words, if they are maladjusted to a normal world, a world is built around them in which they will be adjusted. Proper selection and placement have done much to solve the problem of those who are maladjusted because of lack of mental capacity. Much yet remains to be done in this area.

The demented individuals are those who may have had a certain level of mental capacity and subsequently lost it. Thus they are sometimes rather dangerous.

Senile dementia is one of the forms. Many old people are the victims of it. There is no definite age at which it occurs. Yet, we all know of old people who have lost their mental capacities. Often this occurs without a corresponding decline in physical ability. Owing to this loss or decline in mental ability, the old workers in industry are more prone to accidents than the younger ones or than the same workers when they were younger. A study of age in relation to accidents in two industrial plants employing approximately 8,000 and 14,000, respectively, shows a sharp rise in the accident frequency for the employees over fifty-five years of age, and

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a continued sharp upward increasing trend to sixty-five years, which is the retirement age. The frequency for the group over fifty-five was double that for the group between thirty and forty-five in one plant, and double that of the average frequency for all employees in the other plant.

The old man becomes maladjusted to the world in which he has established himself through long years of experience, when he declines in the mental and physical capacity which once made him capable. He can no longer do safely the tasks which he formerly did. Because of long service, he is usually not discharged from the tasks at which he earns his living. Some plan must be developed whereby he can be shifted to another task which is within his declining capacities. Unless this is done in such a way that his pride is not too much hurt by the shift, he becomes an accident hazard because of the maladjustments based on his bad mental attitude. The problem of keeping the old and declining individual safely is difficult for, although his abilities and capacities are declining, his pride is often increasing. Any plan for taking care of the personal safety of the old man should include a means of conserving his skill and knowledge, his wisdom and loyalty and pride, at the same time that the actual task is exchanged for one that he can do safely. Happy is the supervisor whose old men come to him and ask to be shifted to jobs within their ability. Difficult is the task, if he must shift the old man who does not believe he should be shifted.

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Dementia praecox is a second form of dementia. This is the more or less rapid decline of mental ability in persons who are comparatively young. What may cause this decline is difficult to say and, until recently, no attempt to check the decline has been successful. Experimental treatment with insulin shock is now being tested, but it is too early to state definitely the results.

The chief responsibility of the supervisor who is responsible for the safety of others is to discover those who are the victims of the maladjustment, and to segregate them as quickly as possible from the group in which they may cause accidents.

Do not make the error of assuming that everyone who acts queerly is the victim of dementia praecox. There are many symptoms of it which are very similar to those of other maladjustments of which comparatively normal people are the victims to a slight degree. One observation is not enough to diagnose a case. The trained observer does not pronounce dementia praecox without a careful examination of the history of the case extending over a considerable period of time. Observe everyone whom you supervise who acts queerly. Find out why, if possible. If the individual shows increasing tendencies toward his maladjustment and it is serious as an accident factor, call his case to the attention of a trained observer. In the meantime, do all you can to shield him against activities in which his maladjustment is likely to cause unsafe practice.

Dementia may also be caused by infectious dis-

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eases that affect the nervous system. Syphilis is one of the common causes of such decline of ability. The syphilitic in certain stages of the disease is quite often the victim of illusions of grandeur. In such condition he is likely to show off and get into trouble. Most industries have medical service that can detect the disease and can check or cure it, if it has not developed too far. In the case of maladjustments due to syphilis, as in the case of maladjustments due to any other cause, a thorough medical examination by a competent doctor may discover the physical cause underlying the difficulties and may do much to remove them. Of course, there are maladjustments that may have no physiological component sufficient to cause them. Furthermore, a maladjustment arising from physical disorders may remain as an established habit pattern after the physical component from which it arose is removed.

In the serious cases of dementia the individual will have to be removed from his task for the sake of the safety of himself and others about him. In any event, he will have to be placed in activities within the limits of his declining abilities and capacities. Usually it is necessary to shield him from others about him who are likely to taunt him because of his errors. Since quite often his sense of social responsibility declines more rapidly than his physical ability to take revenge and since in certain types he feels that he is being persecuted, it is necessary to shield him and to guard him, lest by intent

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he cause injury to those who he thinks are persecuting him.

The manic-depressive is the third major type of extremely maladjusted individuals. They differ from most people in their mood changes; not so much in kind, as in degree. They usually have not lost any of their mental capacity. They are the victims of fixed bad habits of extreme mood changes. Most human beings have shifts in moods and even go to extremes at times, but their shifts are not so rapid and the extremes do not come nearly so often as in the case of the manic-depressive. Almost anyone may be in the manic or superactive stage on New Year's Eve and in such a stage of depression on the "morning after the night before" that he will make resolutions. However, if such extremes come only once or twice a year, he may be considered quite normal.

There are slight variations of mood during a single day. Most people are to a degree the victims of a morning grouch. This is followed by a midmorning increase of ambition which rises to a midday peak. The early afternoon finds them in serious toil. This in turn is followed by the four o'clock letdown. Even the dinner hour is not enough to ward off the twilight blues for some. With darkness, some turn to find a way out of their depression in hilarious activity or an attempt to drink away their sorrows. Others lock their doors and retire to rest in hopes of defense against the depressed feeling. The morning after the night before is likely to depend pretty

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much on the manner in which the night was spent.

Those who are responsible for safety direction and instruction of others would do well to fit their activities into the proper places where the best results will obtain and to take account of their own moods. The supervisor who, in a grouchy mood after a bad night at the bedside of a sick member of his family, sullenly commands a worker also in a bad mood after a wild night in which he almost drowned his sorrows permanently is likely to get some pretty nasty situations on his hands before the day is far spent. The worker may even cut off his own finger with as little attention to what he is really doing as he would, in his imagination, chop off his "blankety-blank" supervisor's head. The same supervisor in a different mood would talk differently and the worker would react differently. A worker once said, "My boss can call me any name or tell me anything to do, if he smiles when he says it and I am in the right mood; but early in the morning he would do just as well to say as little as possible because I'm not always feeling too good when I come to work."

The manic-depressive is prone to accidents to even a greater extent than the individual who has very slight mood changes through the day. In the manic or active state, the extremely maladjusted individual is likely to smash things about himself, including the bodies of his fellow men. In the depressive state, he is so apathetic that nothing makes any difference. In either case he is likely neither to

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follow safe practice nor to give any attention to learning about safety. Worse yet, he is a definite hazard to others about him, especially in the over-active state. Extreme manic-depressives must be removed from their tasks and carefully confined, if safety is to be promoted and accidents avoided. Those of lesser degree must be supervised carefully and sympathetically, with a full understanding of the kind of reaction that may be expected during each extreme of mood.

We usually make a grave mistake in dealing with people who are maladjusted in their moods. We tend to speak up and encourage their extreme activity and to "cry the blues" with them when they are depressed. The thing that should be done is to cushion both their rapid rise and rapid fall of mood so that they stay in the normal range most of the time. Accidents may be caused by people who are in the normal range of adjustment to their world, but it is not likely that such accidents are so frequent as those caused by individuals who are extremely and excitedly active or deeply depressed.

Bad Mental Habits.—Even those who are considered normal in most respects may be the victims of maladjustments in certain areas of their lives. Many people have formed bad mental habits concerning specific problems. Perhaps the old Quaker was correct when he said to his wife, "Methinks the whole world a bit queer except me and thee, and there be times when me hath my doubts concerning even thee." There are many types of these

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mental habit patterns that cause us to be maladjusted. Most of these maladjustments arise from conflict situations.

Whenever two equally well-established habits are brought into opposition and neither can be denied, a conflict exists. A man who has for many years followed a habit of loyalty and obedience to his boss may suddenly find that he has a new boss to whom he cannot be loyal and obedient, because he has established for many years the habit of being resentful of a certain type of person. He now becomes the victim of a conflict and will likely attempt a solution which will cause him to be termed maladjusted. He may malingering on the job and blame it to a run-down physical condition, or he may take to drinking and boastful talk. He may do almost anything to escape the conflict, except openly tell his new boss he cannot be loyal to him.

There are several ways in which people do adjust to a conflict within themselves. One is to compromise the two habit patterns and take some middle course. This quite often works and is the method used by most people, most of the time. They make the best of a bad situation. Others openly deny one or the other of the conflicting patterns and make peace within themselves, though others may be adversely affected. But too often the conflict continues to exist without the removal of the cause and, being unable to accept the conflict, we find some way to relieve the tensions set up by the conflict. When these are out of the bounds of

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the normal methods for the relief of tensions, we are maladjusted and the world calls us "crazy."

Making the Maladjusted Safe.—Those who are maladjusted require special attention if accidents are to be avoided. First, there is the problem of proper placement to avoid accident hazards, once the type of maladjustment is known. This problem may require a careful study and the formation of new attitudes concerning job analysis and specification and job evaluation, as well as a revision of opinion concerning such factors as merit rating and seniority. The problem is not easy, but some attempt should be made to solve it. A man cannot be placed on a job by his skills alone. His attitudes and his level of adjustment as well as his specific maladjustments mentally and physically must be considered in the attempt to place him at a task where he will be effective, both in efficient expenditure of energy and in safe practice of performance.

The second angle in making the maladjusted individual safe deals with proper adjustment of his attitudes and habits. Some individuals may need no more than a suggestion as to a better pattern of adjustment to the conflicts that arise from their daily experiences. Others who have well-set maladjustments arising from specific conflict situations may be cured or helped by giving them a chance to talk about their trouble to a sympathetic listener. Still others will respond only to the long and difficult reeducation which is necessary to change long-fixed, bad mental habits, and eliminate habits of

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useless and energy-consuming physical compensation.

The steps in this reeducation type of mental hygiene are somewhat as follows:

1. The individual must be made aware of the difficulty without belittling him.

2. A desire must be created or aroused in him to correct the difficulty by his own efforts.

3. He must find a sufficient cause, remove it, or show that it no longer functions or that it actually does not warrant the extreme action resulting from it. He may have to be helped in finding the cause. The cause he believes to be sufficient may not actually be, and need not be, the real cause of the difficulty.

4. He must be led to lay plans for making the proper adjustment and for breaking the old pattern which will otherwise continue to function as a fixed habit even after the cause is eliminated.

5. In the follow-up he is encouraged when he becomes disheartened but is led to make his own adjustments. The supervisor at this point should not serve as a crutch. He should not be too close to the individual helped, but he should be available to give needed advice when called for, or encouragement when the going is hard.

It takes sympathetic understanding and patient effort to reeducate the maladjusted, but it is well worth it, both from the viewpoint of personal satisfaction and from the viewpoint of adjusting another

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individual to a task which he may perform more efficiently and safely.

Where the maladjustment is not easily eliminated, the safety instruction should be fitted to the level of the adjustment of the individual.

The instructor must not neglect to fit the instruction to his own minor maladjustments and idiosyncracies as well as those of the workers. His methods and plans should be developed so that he may do his most effective work regardless of the methods that may have proved successful for others. However, he should know successful methods used by others and adopt them as his method with adaptations that allow for his own peculiarities.

Whenever it is possible, the maladjustment should be corrected, not only to ensure greater immediate safety but also to make it possible to give instruction more effectively. The methods of mental hygiene and reeducation, listed in the section Making the Maladjusted Safe, may be employed to prepare the student for effective instruction as well as to make him better adjusted to, and more safe in, his immediate environment.

Is Carelessness a Form of Maladjustment?—An analysis of the reports of accidents in three plants employing a total of 23,000 workers showed that up until 1930, approximately 85 per cent of all reports listed *carelessness* as the chief cause of the accident. During the last several years there has been a tendency to eliminate that term in favor of a more detailed description. In two of the three

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plants mentioned, the accident report now will not be accepted if carelessness is listed as the cause. The argument is that carelessness is a blanket term that has no meaning and that covers up the real causes of accidents.

Carelessness is not only a blanket term, but it actually has little or no meaning as applied to accidents. Most of us do not know of a single case in which the man having or causing the accident *just didn't care*. So this meaning can scarcely be given to the term. If we mean lack of proper care when we say carelessness, we must go further to explain in what area the lack of exercise of care or caution existed. In that case, an analysis is made of the more basic factors and the terms "carefulness" and "carelessness" are of no value.

A further analysis of several hundred accidents in which carelessness was listed as the cause revealed the following factors as principal causes:

1. Low intelligence.
2. Lack of knowledge.
3. Lack of ability and aptitude.
4. Inattention and lack of interest. (This comes as close to being *carelessness* as anything we may find.)
5. Worry, fear, and a feeling of insecurity.
6. Desire to be noticed.

Each of the first four in the foregoing list has been discussed separately in a previous chapter. The last two have been included in the general discussion throughout the previous chapters.

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There is no value in saying that an accident was due to carelessness when there are specific factors which may be considered as causes and which may be removed. To use the term "carelessness" is to cover up the real cause. It gives evidence of a lack of desire to discover and eliminate real causes or of a lack of understanding of the whole problem of accident prevention. Carelessness is a blanket term that covers up the factors it includes. If reports are to be used as evidence to discover causes, the term should never be used in connection with an accident.

Some Specific Cases.—The following are cases that were reported as being due to carelessness and were later restudied to find the real causes.

1. "A. J.—. Lost time—two metatarsal bones broken. Cause—carelessness. Other factors—showing off."

Upon more careful investigation, which included the questioning of "Big Al," it was found that there was a combination of circumstances that led to the accident. Al was carrying boxes of tin plate into a boxcar. The foreman found him carrying only one box, while two other much smaller men were carrying two at a time. He did not know that Al had the last box that was ready for loading. He called Al a "big lazy lummo." He told him he was twice as big as the other fellows and was doing only half as much work. Al was a quiet fellow who took such things seriously. The next day he carried four boxes at a time. This was too big a load and too

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covered upon the more thoughtful investigation of this case.

In the above cases several specific factors such as lack of proper supervision, dullness, excessive worry, the feeling of insecurity, pride in doing what is thought to be expected, are far more complete descriptions of the cause or causes of the accident than carelessness. Furthermore, listing of such factors provides a much more fruitful approach to the study of the causes and means of removing them. The listing and study of such factors give the clue as to how we may deal with some very troublesome types of maladjusted individuals. Two of these are the so-called "show-off" and the "bully."

The show-off may be classified into several groups. First, there are those who are denied in some of the circumstances of life, the right or opportunity to realize their ideal fully. They make up for it by overactivity in some other area. For instance, the "henpecked" man about the home must demonstrate his manly abilities at the corner tavern or at the shop. To him it is not evidence of intent to show off; it is a necessity to show that he is a man.

To deal with such a case it may be necessary to show him that he has a mistaken ideal. It may be possible to show him that his method of fulfilling his ideal is wrong, or that he may fulfill it by directing his energies into activities of safety promotion where he will be noticed for his fine conduct.

Second, the so-called "show-off" may be fulfilling misunderstood demands. In this case, he may be a

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loyal fellow who takes the hasty reprimands or suggestions of others at face value and attempts to fulfill the letter of the suggestion with no discrimination as to real meaning. Be careful that your instructions are clear and that what you say conveys your real meaning to the mind of those to whom you give instruction. Sarcastic remarks have often been taken at face value and have brought trouble down upon the heads of those who made them and those to whom they were made. Mean what you say and say what you mean, calmly and with easy dignity. Otherwise, you may be developing a "show-off."

Of course, there is always the third possibility that a man may by intent be a show-off. He may have developed a bad habit of showing off which remains after the original cause for the habit has disappeared. Sometimes such individuals can be shown the folly of their actions; sometimes they must be stopped short. However, discipline should be saved as a last resort to be used after everything else has been tried.

The "bully" may be so because he has a superabundance of energy and ability and a lack of training in the ability to use it. Usually, however, the bully is one who is afraid of something in life and is attempting to compensate for it. The ten-year-old boy who has been browbeaten at home and is not capable of getting along in matters of self-defense or acceptance by others of his own age, and

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who is given the idea that he should be a real boy among boys, may satisfy the demands by beating up all the eight-year-old boys in the community. He is a bully because he is afraid of normal circumstances of life in his own group, but has an idea that he can compensate for his difficulties by picking other circumstances.

The man who is dangerous or unsafe because he is a bully can usually be handled quite successfully if he can be shown that the thing of which he is afraid is not sufficient cause for fear, and that he has chosen the wrong means of fulfilling his false ideal of normal adjustment. How can you find what is causing his fear? Usually the thing he boasts about most loudly, or swears about violently, or attacks most viciously, holds the clue to his fear. He is covering up at the vulnerable spot. If you ever touch that spot sympathetically and in an attitude of kindly helpfulness, he will break down. Then the louder he has cursed and boasted, the more bitterly he will sob out his story. When he has told it, he is ready to be helped into the formation of new ideals and a new system of habits. Help him to help himself; never do it for him.

The conceited, the overproud, and the stubborn individuals are usually only modifications of the same type to which the bully belongs. Most of them are the victims of extreme inferiority complexes combined with high ideals which they are unable to attain. They are handled best by giving

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them reasons for real confidence to replace their lack of confidence, and reducing their false high ideals to usable ideals based on accepted true values. They must be readjusted to keep them out of danger.

CHAPTER XIII

THE IMPORTANCE OF SUGGESTION

There are two meanings to the term "suggestion" as it is used in connection with safety. The one refers to the critical proposals made by the workers for the improvement of working conditions and the development of accident prevention and safety promotion programs. The other meaning of the term deals with the mental process by which one thought leads to another, and the uncritical acceptance of an idea or proposal made by another individual or presented by such objects as posters, advertisements, and pictures. In this chapter the discussion deals with the second meaning of the term.

Suggestion and superstition play a large part in the problem of safety promotion. Suggestion may be used either to advantage or disadvantage in teaching men to be safe. Suggestions may take either the positive or the negative form. Positive suggestion may be used either for or against any given idea or practice. On the other hand, negative suggestion may support or defeat the same idea or practice. Positive suggestion is that which points out what should be done; negative suggestion calls attention to some other course of activity or think-

ing. Superstition and traditionally accepted ideas, which have been accepted without proof, often form the background against which a stimulus meant to get one reaction quite as often promotes a different or even opposite reaction. Thus it is well to consider the relation of suggestion and superstition to the safety problem.

Most People Are Suggestible.—There are varying degrees to which different people are suggestible. Some have set habits of logically arranging any stimulus they receive and analyzing it for its true meaning; others are found at the opposite extreme accepting every stimulus against whatever background is most in focus at the time. The great mass of people are distributed between these two extremes, with the majority fairly analytical at times and in some areas of life, and delightfully unaware of how they think and act at other times.

If a person is very suggestible it is likely that he will follow safety suggestions readily; on the other hand, he will also follow just as readily the suggestions against safety over which you may have little or no control. You may by suggestion through posters, talks, or any other means get him to wear goggles. On the other hand a picture of a man in goggles may suggest to him the idea that he doesn't look good and he may take them off. The very suggestible person is a difficult case with which to deal in promoting safety. He will follow any wind that blows. In his case you must control the *wind*.

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You must arrange to have only the proper suggestion offered.

In the case of the person who is extremely analytical it is imperative that the suggestion be positive and that it fit in every detail into a logical scheme. Otherwise, he will discard it as being valueless because it is not perfect.

For the majority of people one must assume that suggestion will be accepted chiefly against the background of experience with some analysis in certain areas of life and very little or none in other situations. In all cases it is well to control the suggestion so that there is a minimum chance of its meaning's being misinterpreted, and so that it may be followed with equal advantage by those who are extremely suggestible and those who are extremely analytical.

Partial Stimulus Patterns.—Perhaps the very nature of suggestion is that partial stimulus patterns are perceived as whole patterns. In safety promotion, then, it is wise to use only such stimulation as will consistently suggest the whole pattern which is actually desired. A foreman, wishing to suggest the safe practice of walking rather than running, put up three short barriers in the aisle. They were about thirty inches in height and staggered so that the men could walk around them but could not easily thread the maze while running. Proudly the foreman watched when the whistle blew. He was sure that his suggestion would have the desired effect. The men would see that they must walk rather than run. What happened? The first man

walked around the barriers. The next one, who usually walked, seeing the barriers said to the fellow with whom he was walking, "Watch me take the hurdles," and broke into the running form he had used when he was a star on the track team. In all, three men took the barriers on a run. Two others ran up to them and walked through and ran on the other side. The stimulus which the foreman supposed would suggest walking was part of another pattern for some of the men and, as part of that other pattern, suggested running even to some who had not thought of it before.

It is evident that enough of the desired pattern must be presented so that error will be avoided. How much of a stimulus is necessary to suggest the desired activity depends upon how closely the given stimulus is related to the whole pattern desired and to no other, and upon the ability of the individual to substitute the partial stimulus for the correct pattern. In all cases, be sure that the stimulus has only one meaning and does not suggest activity or thinking in a direction opposite from that hoped for.

Background Must Be Considered.—In the case of any suggestion, the background of experience of the individual is very important. Two men looking at a picture which was just a little obscure argued as to whether it was that of a duck head or a rabbit head. One raised ducks and the other rabbits as a hobby and each defended his opinion. The background of immediate and even remote experience does much to color the stimulus which is used as a

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suggestion, especially when it is a little obscure. Be sure that all suggestions are clear as to meaning and that they strike a background of common experience, in so far as possible, in all individuals. The man who has just seen a bar drop from a scaffold may give proper meaning to the poster which shows a bar laying on a plank, with the caption, "Put your tools away." To someone else this same poster may suggest the proper way of laying a bar on a plank. Of course, the latter fellow is mistaken and foolish; but he is human and some humans are like that. The background of experience of the first man made possible the one meaning; that of the other perhaps made possible the opposite and incorrect interpretation.

Too often it is assumed that a good specific suggestion is valid wherever it is applied. This is not the case. Even in the same occupation the specific suggestions do not always carry meaning to the general practice. The bricklayer foreman may tell his men not to leave pieces of brick on the scaffold but to some of them, at least, that does not mean that the hammer, trowel, and pieces of wood should also be cleared off and properly placed. The suggestion must be general enough to strike a background of experience to all, and yet specific enough to mean each individual in every detail.

The wise supervisor tries to know enough of the background of the individuals he supervises so that he can pick proper words and demonstrations to suggest the full meaning which he desires each of

them to get from the material presented. There is just no use trying to suggest safety-mindedness by talking and using examples from a coal mine when talking to a group of men in a furniture factory, none of whom have ever been in a coal mine in their lives. On the other hand, coal-mine situations form the background of coal miners and may be used to advantage in suggesting safe practices to them.

Some Men Are Superstitious.—A superstition is a belief in something which may have at some place or at one time been partly or wholly true, but which is not valid to the extent to which it is at present believed. So confused and twisted have some of the superstitions and beliefs become that they lack truth altogether. Some of these superstitions are perfectly harmless as well as perfectly absurd. However, if the belief in them, or partial belief, causes us to do dangerous things, they are not so harmless. Too often they form a large area of the background of experience as far as memory is concerned. Against this background stimuli suggest some very peculiar and often unsafe activity.

Some of the more commonly recognized superstitions, such as the black cat, the ladder, and mirror type, have little effect. Most people repeat them but do not actually believe them, nor act as if they did. However, there are many others, just as common and just as foolish, that are not recognized as superstitions. Many people still believe implicitly in the powers of the horse chestnut, the moon, special numbers, and special days. Certain of these

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superstitions lead to neglect of duty and others may lead directly to improper activity and unsafe practice.

A man was killed in a coal mine because he failed to obey safety rules. A second man was injured a week later by a careless buddy and a third was killed by a train on his way home from the mine. The miners said the "jinx" was on the mine. In that community when they said "jinx" they meant it. They weren't fooling. Some of them said you could see it hanging over the mine like smoke and that it would never leave until the mine was sealed. Not a man would return to work for two weeks. When they did go back, they were all so frightened that they were dangerous to themselves. Many of them never returned to work but moved to another mine. Those who went back stayed until another man was injured seriously and then the mine was closed by the company because the workers refused to go into the pit.

After ten years, another company opened the mine. Not a former miner would enter it. Men were brought in by bus from another town. They were informed of the jinx and at once began to work unsafely. Three men were killed within twenty days and in each case because of careless practice due to the "jitters" caused by the jinx. The company closed the mine. If you ask why, the owners will tell you because it was an unprofitable venture; the people who remain in the village will tell you it was the "jinx."

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Beyond these rather intangible but nevertheless very real spirits, which follow some people and make them through fear and worry prone to accidents, there are many other ways in which superstition interferes with safe practice. Some things must be done and others not done in keeping with the prescription by superstition. Each area of life has its own set of superstitions, its own way of doing or not doing certain things because they are the things to do or not to do. If these practices have a basis in truth, they are good; if they interfere with the carrying out of normal and safe practice, they are detrimental.

Many people use protective devices to help them avoid accident; some of them are highly questionable. The use of a rabbit's foot, an eagle claw, or a shark tooth as a protection against accident may seem absurd. Yet, in one crew of seventy-four men an investigator found eleven who carried such articles as charms against accidents. The foreman wore a rabbit's foot on his watch chain. Of course, not all these men really believed in the effectiveness of these charms to save them from accident if they were otherwise neglectful. On the other hand there are some men who believe partly or wholly in the influence of the charm.

When such protective devices or charms are carried as trinkets or prized possessions with no thought of their power, they are probably quite harmless. However, when a man feels that the charm will protect him and he neglects safe practice because noth-

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ing can happen to him while he carries his rabbit foot, he is likely to neglect the attitudes and practices that will protect him.

The belief in the charmed life and the extreme faith in the protection of God have led many men to take undue chances. So great are the chances they take that even their charms and gods do not save them.

Fatalism.—The fatalist presents a special problem. He may not subscribe to any other form of superstition. He may be highly religious or extremely irreligious. He believes that his life span is predetermined, that whatever happens to him was supposed to happen, and that nothing he could do would change it in the least. His *time* is set. Nothing can happen to him until his *time* comes. It is futile to do and talk about so many things to save his life. He knows nothing will change the plan. If he causes injury to someone else, he tends to believe like the Puritan father whose son asked him why he carried his gun to church when he knew he would not be killed by the Indians until his *time* came. The father promptly replied that he might just happen to meet an Indian whose *time* had come. There was probably more practical sense in his remark than there is in the fatalism of many of the people about us at present.

The problem is wider in scope than we might wish to believe. There are many people who subscribe wholeheartedly to the fatalistic belief. Many men will tell you, "I have done what I could and now

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what will happen will happen." No blame is accepted and added effort in the direction of safety is futile.

In all of these cases of superstition and fatalism it is necessary to point out true relationships. The man who is totally superstitious or fatalistic may not be changed; the one who is fatalistic about the area beyond his own powers may be shown that a little more effort will clear up much of that mysterious region. In many cases superstition or fatalism is a good excuse for laziness in attacking the real problems of life. In other cases, lack of knowledge of how to meet the problems of life is the cause.

If superstition and fatalism are accepted because of ignorance or lack of definite plan, rather than because of willful and conscious belief, much may be done to remove them. The man may be instructed and plans of procedure shown him. He may be aroused to show an interest in going beyond his present accomplishments if he has his attention properly directed and he is fully informed.

Superstition is best dispelled by knowledge. The person who lacks knowledge on specific points tends to fill in the gaps with untested material that may not be true. There is a tendency for the uninformed to unite two things happening almost simultaneously as cause and effect even when they may have no relationship. It may be wise for those who know the relationship to point out the facts to those who lack knowledge.

The old man who was asked if he wasn't afraid

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he would die when his dog howled, answered that the confounded dog had been running through the cockleburs again and that he always howled when he got burs in his fur. Some of the members of his family who did not know the habits of the dog so well had heard him howl only on the occasion of a death in the family. Therefore, howling meant death to someone in the family. The old man laughed at the idea and said it would mean death to the dog if he didn't stop. He knew the facts. His relatives had built a belief on error and could be accused of superstition, which only proper information could eliminate.

Men who follow unsafe practices because of superstition based on partial truths or on error may be led to eliminate these practices by proper information. The true relationship of the facts must be pointed out. It does no good to deny facts. Many times, however, the undeniable facts are improperly related. It is the task of every safety promoter to know the proper relationship of the facts that confront his followers and to instruct them properly.

Against the background of uncorrected superstition, many of the ideas presented to promote safety suggest practices that are unsafe. This background must be reconstructed and the superstition removed. When the individual is properly informed, the suggestions used may be effective in promoting what is intended.

Safety May Be Taught by Suggestion.—It is quite impossible to say in complete form or show in

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complete detail to every man what he should know concerning every detail of safe practice and attitude. Some of it must be done by a shorter method. The assumption is that well-ordered stimuli may suggest proper practice and attitude when those stimuli fit into the background of the experiences of the individual.

Most people have had instruction throughout most of their lives on conduct that will keep them safe, but they are not always consciously aware of and attending to the proper attitudes and practices. They forget for the moment or other things divert attention and activity from safe practice. It is quite evident that it is not necessary on each of these occasions to give complete instruction all over again. A suggestion, a stimulus that will touch off the proper pattern of past experience into the channel of safe acting and correct thinking, is usually all that is necessary.

Even in the case of those who do not know proper attitudes and practices, suggestion may be used. They do know something. They all have a background of past experiences. By suggestion the new material may be taught them against this background. Partial stimulus patterns may be presented which they can complete from their own backgrounds. In every case, the partial pattern must be full enough so that the right direction is given and so that the material of past experience is called up to complete the pattern desired rather than some other pattern.

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Reminding Suggestions.—Since men are prone to forget, they must be reminded. Since other things divert their attention and activity, they must be reminded. Many industrial plants have established suggestions to remind men of safety. Some plants blow the whistle in the middle of the shift as a safety reminder. In other plants the men raise their hands at a signal from a supervisor. Many such devices have been used as reminders to suggest safe practice. Sometimes they have been effective; sometimes they have become mere symbols devoid of meaning.

The effectiveness of these suggestions is determined by their acceptance as reminders of a more complete pattern of thinking and acting. When they are stimuli that affect well-informed and well-supervised men who have accepted the general idea of safety and safety promotion, they are probably effective. When they are presented without having established a proper background, they may be ineffective or even annoying.

Too often the *reminders* are not reminders because they have become hollow and meaningless symbols which are carried out by habit. A whistle and hand raising had been very effective as reminders in developing the safety attitude and in reducing accidents in a plant; they were continued for many years. Eventually one department had entirely changed its personnel. The new men had learned to raise the hand when the whistle blew and did so by habit. When they were questioned as to

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why they did so when the whistle blew, the common answer was that they were told to do so the first day in the department and that everybody did. The majority of them did not know why; some of them thought it was a very silly practice. The symbol had never been given meaning for them and thus had no value in suggesting safety.

Once-meaningful symbols may lose their suggestive value. It is necessary not only to make the individual aware of the meaning of the symbol when it is established but also to review him from time to time on the meaning. If the symbol can become a habit and lose its meaning, and that meaning cannot be easily reestablished or becomes less effective than some other type of stimulation, it should be discarded. It may no longer suggest what it once did and is thus of little value.

Departmental Letters and Pay-envelope Stuffers.
—Departmental letters and slips in the pay envelope are sometimes used to suggest safety. Sometimes they are effective; more often, they lack what it takes to get men to think.

A letter that comes out in mimeographed form is likely to be hurriedly read and filed either in the depths of some desk drawer or in the wastepaper basket. Most of such letters are too general and lack a personal touch. The safety slip in the pay envelope gets little attention. The thinking and attention are almost completely diverted to the amount of pay and what shall be done with it.

To be of value the letter must deal with problems

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of specific interest to the one who receives it. It must be a personal message to him and must call for action or thinking on his part. Usually the form letters sent at regular intervals lack all these qualities. Unless the letter is so written that it gets results, safety might better be suggested through a more direct and personal contact with the persons who most need the suggestions.

Meetings.—The group safety meeting, held at regular intervals just because it is scheduled, quite often suggests almost anything else than safety. To have a meeting for safety without any plan or purpose is quite often worse than to have no meeting at all.

Should the safety meetings be eliminated then, because so often they fail to suggest safety? Not necessarily. If the meetings are handled properly, they may be very valuable. To be valuable they must suggest safety rather than be a necessary evil, which suggests to those who attend that this whole "business of safety" is a waste of time.

In one group with a very good safety record the leader was asked if he did not wish to discontinue his weekly safety meetings. His answer was, "No," and he insisted that the meetings were very valuable. This is the way they were run. Each member was at his scheduled post at the appointed time. The leader was also present and on time. The meeting never lasted more than fifteen minutes. A member appointed the previous week was allowed just five minutes to say whatever he chose on safety.

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Five minutes were allowed for discussion of what he had said or for other comments. Then another member was designated for the next week's discussion and the meeting was closed.

The following day the report on the bulletin board stated what question had been discussed and by whom, what conclusion had been reached if any, and just what was to be done with any suggested change in practice or procedure concerning safety. The leader and his subordinates gave personal attention to every suggestion made at once, and either carried it out or explained why it could not be carried out.

The members of the group were interested in safety and also in safety meetings. They liked to go to safety meetings. They felt that they got something. They also felt that they were promoting safety for themselves, since they conducted the meetings. They felt that the company was interested because their supervisors were present and never failed to do all they could to put all worthwhile suggestions into effect. Safety meetings of this type, with a plan and purpose, suggest safety.

A meeting in which the men are harangued and blamed by a supervisor sometimes suggests an attitude unfavorable to the whole idea of safety. We have all been the victims of the annoying type of meeting. The leader comes in late. There is no plan. One person usurps all the time. The supervisor is annoyed by the fact that the meeting must be held. He is too busy otherwise. Minor points

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are discussed. Much quibbling over details leads away from the subject. The meeting drags because everything is buried with it except the determination not to attend any more such meetings. Such meetings do not suggest safety. They do suggest an escape from the possibility of repeating the experience and sometimes even suggest an active rebellion against safety.

Posters and Signs.—Posters and signs are used in almost every situation in which we wish to promote safety. One of the first things we encounter on entering an industrial plant is the safety poster. Signs line the highways cautioning against improper driving and suggesting safety. All about us we see the pictures and slogans suggesting that we keep our eyes, hands, and feet intact, that we stay alive and avoid injury. Do all these signs and posters really suggest safe practice?

There is some doubt as to their effectiveness. Individuals will tell you that some of the signs and posters suggest the opposite activity from that intended. Others will admit that they didn't notice the posters or that they didn't attend to them closely enough to get the meaning. In most cases, however, we must assume that posters and signs, if properly made and displayed, have a good effect; that they actually have value as a means of suggestion. There is a code for safety signs to be used in industry. This code designates size, color, and other specifications that make for uniformity and effectiveness. The code prescribes simple, understandable, uni-

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form, and attention-getting signs. There has been a definite attempt to study scientifically all the factors that contribute to their effectiveness. Only recently an attempt was made to change the wording on all safety signs to give only positive meaning and thus avoid negative suggestions.

In the field of posters, care has not been exercised to the same degree. Often the posters, calendars, and other media of suggestion are artistic but do not get the desired results. They may be very effective for the individuals who create and judge them, but of little value to others. It is time that studies were made to determine the effects of definite types of posters on different classes of people and on various individuals. Some posters have little attention-getting value, some call the attention of a whole group of people or of individuals to the wrong thing. All these possibilities are now known but most of these problems need much further study.

The poster, to be valuable as a means of suggesting safety, must be attention-getting in its color, size, and content. It should suggest correct and proper procedure rather than incorrect practice. It should be displayed in a place where it is easily read and will cause no annoyance. It should be removed when, through familiarity, it is ignored. It should carry positive rather than negative suggestion.

Negative suggestion posters get more attention and their content is retained longer than those of positive suggestion. Many have therefore assumed that they are more valuable than the positive sug-

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gestion type. This would be true, if they did not also actually suggest the wrong thing so effectively to the very people who most need the positive direction in their activities.

Negative Suggestion.—Through negative suggestion in posters, signs, statements, methods of teaching, and conversation, the wrong thing is often taught. In safety, tell, show, and suggest the correct way to do a thing. The correct or safe practice should be emphasized.

The supervisor, who wishes to teach a new man the safe way to operate a shearing machine, should tell him and show him how to do it the correct way. If he tells him and shows him the incorrect methods and adds that he is to avoid these, he has suggested that there are other methods that could be used. He should not be too much surprised if six months later the man using unsafe methods tells him that those were the methods he was taught.

When the problem of safety is being attacked by means of suggestion, the full meaning and the actual practice must be constructed from the partial pattern of the suggestion. If negative suggestion is used, the wrong pattern may be constructed because the person failed to grasp the implication. The problem becomes the more interesting when we stop to realize that the people who most need suggestions to make them safe are quite often the people least capable of abstracting meanings from the medium of suggestion used.

The old story of the farmer who told his rather

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dull hired hand to look twice before he leaped is a case in point. The farmer had hoped to make a suggestion that the man would use the ladder to descend from the hay loft. The man looked twice and leaped. His leg was broken. His answer to the irritated farmer was that he had only done as he was told. He was dumb. He could not grasp the negative implication and transfer it into positive action. There are a lot of other people in the world just like him in that respect. If you want a man to use the ladder, suggest it positively. If you want him to jump, imply by negative means that he should use the ladder, and he will probably grasp only the first stated side of the implication and jump.

Negative suggestions sometimes arouse fear. The picture of a mutilated child gives some automobile drivers such a shock that they drive unsafely. They do not overcome the fear and take the positive suggestion from the picture. They may even be conscious of the positive suggestion, but the fear aroused causes them to be unsafe in their actions.

The type of poster or picture that arouses fear, repulsion, and anger by showing the horrible things that result from unsafe acts quite often does not suggest safe acts, but does so disturb those who really attend to them that they act unsafely. The series of pictures on the calendar put out by the National Safety Council several years ago showing the terrible results of unsafe acts aroused much interest. Many comments were made which gave evi-

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dence that this type of negative suggestion for safe practices was not nearly so effective in promoting safety, as it was in arousing feelings and emotions that are adverse to safe practices. The Council wisely reversed the policy the following year and by means of pictures suggested the good results coming from safe practice.

Negative suggestion by showing the wrong way to do a thing sometimes creates a feeling of familiarity with that way, which serves to form a background of experience against which incorrect habits are formed. Attention is called to a way of doing something. Then when the stimulus comes to do the thing, unless the correct way is very positively shown at the time of the stimulus, the only way with which the individual is familiar becomes the way to act. If the suggestion has sufficient qualities to get attention, learning follows. Quite often that learning goes only as far as the immediate stimulus of the suggestion and does not change over into the positive implications. Thus, the individual learns to do a thing the way it is hoped he will avoid doing it. Here, again, the less capable he is mentally the more likely a man is to fail to go beyond the negative meaning; and the more likely he is to be the very one for whom the suggestion was meant.

The trite saying that "familiarity breeds contempt" may not be true in all areas of life but it has a grain of truth in it in the area of safety suggestion. A structural ironworker was asked if it did not make him very cautious after four men had

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fallen. He replied, "No, it has been happening so often I'm getting used to it. The only thing that worries me is that these fellows have shown me the wrong way to act so often that I'm likely to go and do the same thing. You know you can forget the right way and learn the wrong way if you see it often enough and don't stop to think that it is the wrong way."

Safety suggestion is often negative in that the great effort made suggests that the program is for the benefit of the promoter rather than for the worker. The efforts may be positive in direction and good in intent, but if they arouse the thoughts that this is a program for the benefit of the company or the personal glory of some staff member, rebellion rather than cooperation is suggested.

Undoubtedly all safety programs are for the benefit of both the individual worker and the organization. However, the methods sometimes used by enthusiastic promoters of safety leave out the individual. He is made to feel that this program belongs to Mr. Brown, the safety director, or to Mr. Smith, the foreman. He sees someone else promoting his own self-interests, and true to human nature he becomes enemy to the cause. Anything that promotes someone else and does not include him equally must exclude and demote him. Such becomes his reaction when he is off his guard in his thinking and action. Thus he must work against the program that belittles him or, at best if he must accept it, he will do so passively rather than wholeheartedly.

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The enthusiastic glorification of safety as a means of saving so many dollars for a company or community sometimes suggests to the individual that safety is for the organization and not for him. Therefore, he ignores safety promotion and in some cases proceeds to act unsafely to spite the organization. The organization may be far more able to stand the loss incurred by this unsafe act than the man himself, but he does not think of such things. The saving to the organization may mean, if fairly handled, an increase in his pay. He does not think of that either. He sees only the things on the surface that are called to his attention. These may suggest to him the idea that safety is for the company and not for him. Then he forms an attitude against safety and against the organization.

The way in which safety promotion is carried out also too often suggests that safety is a special program, rather than a method of specific and general behavior. This is a negative form of suggestion, for after all, every safety program is aiming at safe practice on the part of every individual all the time.

The individual may be actively in favor of promoting safety by means of the program carried out, because he is made an important part of it. However, if the program gets to be so beautifully built that it gets removed from the actual safeguarding of individuals it becomes a symbol with a halo around it and is worshiped as such. Everybody gets enthusiastic over the annual safety dance, everybody attends safety meetings regularly, everybody gives

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lip service to safety, but nobody knows why there are so many accidents and nobody takes safety down to the actual point of safe practice on the job. In such a situation, the very enthusiasm over the beautiful safety program may be negative suggestion which takes attention away from its essence; namely, safe practice in all activity at all times by every individual.

Good safety programs, even beautifully organized safety promotion programs, are necessary; but they must never leave out the importance of the actual safe practice of individuals. If and when the safety program begins and ends with the idea of keeping John Doe safe and sound, wherever he is, it will be enhanced by all that good organization provides. But if it leaves out John Doe's practice on his specific job, even though it includes him as chairman of a committee, the beautiful organization is merely a hollow symbol which sooner or later will suggest activity against the safety program rather than for it.

Positive Suggestion.—Most evidence tends to show that negative suggestion is usually better than no suggestion at all. Even though it sometimes promotes incorrect practices, it often promotes more correct practice than could be attained without any suggestion. However, when the comparison is shifted to positive versus negative suggestion, the evidence tends to show that positive suggestion is almost always the more effective. There seem to be some specific situations in which negative sugges-

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tion, with command and discipline attached, serve. In most of these situations there has been a failure to use positive direction at a time when it would have been most effective, and an emergency has arisen in which drastic measures must be applied in a "here and now" situation and the consequences, good and evil, accepted. Had the case been foreseen, positive suggestion could have eliminated the possibility of the evil consequences.

The idea that the wrong way must be taught so that the individual may be taught how to avoid it, is an outmoded idea. The new and better idea in safety is that the correct practice should be taught and positive activity suggested and that this is the best fortification against the wrong practices.

A feeling of pleasantness is left by positive suggestion which promotes activity in the direction of the suggestion. The positive suggestion offers a way that does not include the dire consequences to be avoided. The feeling of pleasantness may arise from the fact that an immediate way to satisfy the stimulus is provided. Negative suggestion always causes double effort. You must find out what not to do and then you must find out what to do and how to do it. Positive suggestion relieves one from the added burden of the first step and takes him to the really essential core of the activity. It also eliminates the possibility that the first step might be taken and not followed by the second. If the journey ends with that first step of negative suggestion, the result is almost always bad. A feeling of un-

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pleasantness is generated at the end of the first step of negative suggestion. It is usually unpleasant to find out what must not be done. The second step may or may not contain enough of pleasant feeling to overcome the unpleasantness of the first. In positive suggestion, on the other hand, only the stimulus to do the correct thing is given; the usual result of a suggestion that provides both the stimulus and the way to satisfy it most directly is a feeling of pleasantness rather than of unpleasantness.

This very pleasantness promotes safe activity; unpleasantness tends to make the individual avoid the entire situation. Thus, positive suggestion is more effective not only because it presents only the correct procedure but because it demands activity rather than avoidance.

In all safety promotion, safety should be suggested as an integral part of the job correctly done. Such suggestion is positive, not only from the viewpoint of showing the correct rather than the incorrect method, but also from the viewpoint of making safety of prime interest to the individual who must accept it as an important factor of the total pattern of the job which he is to do. Thus he cannot formulate such negative concepts as the idea that safety belongs to the organization or to the safety director or group leader.

This positive approach to safety as an integral part of the job may mean that some supervisors should take a new view of the task of training men

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for their jobs. Job training includes more than the specific skills of operating a machine. It includes the idea of training in safe specific skills, proper attitudes, and acceptable general behavior.

CHAPTER XIV

FATIGUE, MONOTONY, AND ACCIDENTS

Fatigue and monotony seem to be factors affecting liability to accident. There is far more of logical reasoning to support this contention than there is of actual experimental data. However, there is some evidence to show that fatigue, especially, is a factor in accidents. Fatigue and monotony are also factors that affect the learning of safe practices and attitudes, and of specific organized safety programs.

Types of Fatigue.—Fatigue is often classified as physical and psychological or mental. Essentially fatigue is always physical in nature. Mental or psychological fatigue is the name given to the weariness resulting from physical overwork of muscles kept under tension when there is apparently no need for the tension because no actual labor is being done. The fact that there is no apparent output of work when a man is sitting in a state of worry may lead us to believe that the resulting fatigue is mental or psychological. Actually, the man may have kept the muscles of his back, legs, arms, neck, and jaws under extreme tension. This is hard physical work and the waste products formed under such work cause the feeling of fatigue. It is unnecessary fa-

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tigue in that no outward manifestation of work is evident, but it is, nevertheless, physical fatigue in that the body has been hard at work.

The fatigue that results from actual movement in doing work is more easily recognized as physical fatigue. If a man pushes a heavy load and then tells us he is tired, we can understand for we have seen the evidence of his work. If he exercises his eye muscles in reading a book, we may also understand the resulting tired feeling as physical fatigue. However, if he sits by the fire and thinks through some knotty problem with the muscles of the back under severe tension, it is not quite so easy for us to see that he is doing physical work, and that the resulting tired feeling is just as truly caused by fatigue products of a physical nature.

Because of the presence of outward manifestations of physical work or owing to the apparent absence of such outward manifestations, we classify fatigue as physical or mental, whereas they are both physical in their fundamental nature.

Nature of Fatigue.—The feeling of fatigue is caused by excess waste products in the body. During waking hours and while at work, the fast activity of the cells in the production of the energy necessary to work produces waste products in the body faster than they can be removed from the specific muscles by the circulatory system or even from the whole body by the excretory organs. The body must have time to relax, so that the circulatory and excretory organs may catch up with the overproduc-

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tion of wastes and bring the body back into a balanced condition.

Fatigue may be local or general. In general fatigue, the accumulation of waste products thrown off by the cells is distributed through the whole body and is sufficient to cause a feeling of tiredness. In the case of local fatigue, the waste products are centralized about the particular muscle or set of muscles that have been active. A specific muscle may become so fatigued that it will no longer act, and yet the whole body may be comparatively free from fatigue products.

Cure of Fatigue.—If the fatigue is local, it may be cured by several methods. Rest of the whole body will give the circulatory system a chance to carry the waste products away from the area where they are concentrated. A second way, which is often more rapid in relieving local fatigue than total rest, is to change the activity and use enough of the body to increase the circulation to speed up the process of removing fatigue products from the congested area. However, the increased activity should not be so long and strenuous that it builds up a sufficient amount of waste products to produce fatigue in the whole body.

General fatigue can be cured only by rest or reduction of activity to the point where wastes can be thrown off by the body faster than they accumulate. Usually sleep is the state in which the body brings itself back to a balanced condition. ~~The reduced activity of muscles during sleep does not~~

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duce so much of waste products. At this time the excretory organs catch up with the task of throwing off the wastes accumulated during waking hours.

“Mental” Fatigue.—We have pointed out that the so-called “mental” fatigue is actually physical fatigue. It is chiefly caused by the use of muscles that are not producing the expected kind of activity. Persons engaged in a new type of activity are often completely tired out at the end of the shift, without having accomplished half as much as the experienced men on the job. They have not made so many movements and apparently have not done so much work as the experienced man, and yet they are far more fatigued. If you ask the new man or his supervisor why, they are likely to tell you it is because of the mental strain on the new workman. He is mentally fatigued. It would be nearer the truth to say that he has actually moved more and worked harder than the experienced man. He does not know which muscles to use and which not to use. Consequently, he uses many unnecessary muscles and makes many unnecessary movements. Even the muscles that should be involved in the activity are improperly used at first. Besides all this, he is in a state of confusion and in his desire to make good at the task, he tenses muscles that have no relationship to the job at all. All of this activity, necessary and unnecessary, proper and improper, creates the waste products in his body that give him the feeling of fatigue.

It was a wise foreman who said, “Whenever I find

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a man tired out on a job in my department, I know one of three things is wrong: either he has been losing sleep because of his private affairs, he is ill, or else he is doing the job the hard way. If the last is true, it is my job to train him to do the job the best and easiest way. There isn't a job in my department which should make a man completely tired out if he does it correctly, unless he is ill or is not getting seven or eight hours of sleep a night."

The fact of fatigue often indicates that specific job training is necessary. The man on a new job is expected to be fatigued easily until he learns the correct method of working, which muscles to use, and which not to use. The experienced man should not become fatigued nearly so easily. Proper job training will help the man, old or new on the job, to eliminate unnecessary activity and teach him the proper use of his body to accomplish the task with the least expenditure of energy.

Perhaps as much of the fatigue in modern life comes from the unnecessary tensions as from those necessary to productive activity. Some of these tensions are due to worry and fear, others are due to lack of knowledge of correct procedure at the task. Correct work methods and proper attitudes do much to relieve unnecessary tensions and promote efficiency, without undue fatigue. Incorrect work methods and improper attitudes and worry do much to cause unnecessary tensions and promote inefficient doing of the task with an undue amount of fatigue.

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The whole problem of fatigue, be it physical or so-called mental fatigue, is related to tensions of body muscles in the case of a normally functioning and healthy body. Fatigue can be reduced by teaching correct work methods and proper attitudes in the doing of a task. All cause for tensions due to worry, fear, and anxiety should be removed.

On the other hand a person who is ill or undernourished may be readily fatigued without much muscular activity. Defective circulatory or excretory organs may not be capable of getting rid of wastes at the normal rate. In that case, the individual who is the victim of such disorders becomes fatigued rather quickly.

The use of certain drugs, narcotics, and alcohol, also puts an extra burden upon the body to throw off the detrimental products created in the body. Under this condition, the organs are not capable of the double duty required of them to take care of the body wastes and the additional waste products, and fatigue results.

Relation of Fatigue to Accidents.—Various studies seem to indicate that there is a relationship between fatigue and accidents. The evidence is not so conclusive as one might expect. Perhaps this is due in part to the fact that experimentation has not been very well controlled. Observation is the chief method used and often the facts have been variously interpreted. In general, however, the observations seem to indicate that there is a direct relationship between the two.

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In most work curves, there are increasing periods of productivity at the beginning of the shift. After a time the high level is reached and then begins to fall off until lunch time. Then there is another short warm-up period before the high level is reached. This second level is not held for so long until it fades into a steady decrease until quitting time. Sometimes there is an "end-spurt" rise in the curve during the last half hour. It is generally accepted that fatigue curves coincide with these production or work curves with the exception of the warming-up and end-spurt portions of the curve. Production decreases as fatigue increases. Thus we may assume that the high accident frequency at the peak periods of the day occur when greatest fatigue has been reached and that accidents vary directly with fatigue.

However, one may find that the high frequency in accidents is due largely to the fast rate of production at the peak periods. The factor of fast production is perhaps related to increased accident. On the other hand, the peak frequency in accidents does not show throughout the whole range of the high level of production. The combination of the two factors seems then to be the explanation of the situation. The accident frequency is greatest when the fatigued worker is maintaining a high level of output. When the output level decreases, one of two things happens: either the increasing fatigue with reduced output is not sufficient of itself to cause an

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increased number of accidents, or the worker reduces fatigue at the same time as he reduces his output.

There is some evidence from unpublished records that there is a correlation among power used, output, and the number of accidents. But many of these facts of relationship between production and accident frequency hold only for day workers and not for the night shift. This calls for further explanation.

Whereas the day output and the accident rates for the day shift tend to correlate, the peaks of accident frequency for the night workers are at the beginning and end of the shift. The output curves for the night shift, however, are similar to those for the day shift. Perhaps the night worker comes to his job with his mind well stocked with the thoughts of the day. The day worker comes to his job, on the other hand, fresh from sleep. The high peak of accident frequency at the beginning of the shift is thus due to the fact that the worker is excited and inattentive to his job.

Another question is of importance, however. May it not be possible that the man coming to work on the night shift is actually more fatigued at the beginning of the shift than he is after he settles into the routine of his job? Let us suppose that he awakens in midafternoon. He then proceeds to work in his garden, tinkers in the basement, repairs his automobile, plays tennis or baseball, or maybe goes shopping with his wife. After these activities he has a quick bite to eat, rests a little while, because his

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sleep has been disturbed during the day, and then starts to work a little early, but is detained by some of the boys down at Joe's place where he stops for a cup of coffee or other refreshment. When he arrives at the plant he has had from eight to ten hours of activity. This activity is often less regulated and more strenuous than his regular job. He is tired when he arrives. Perhaps the general attitude of men on night shift, that production is not expected to be so high as that for the day shift, is partially caused by the feeling of fatigue they have when arriving. All night-shift supervisors are familiar with this attitude and many of them actually hold it themselves.

Perhaps, then, fatigue correlates with accidents on the night shift as well as on the day shift. In fact, here the factor of increased output during the shift is removed. There is a combination of the factors of fatigue and general excitement and inattention to the job, which explains the difference in the pattern of accident curves between the night shift and the day shift, where the combined pattern is made up of the factors of fatigue and fast production.

Under the conditions of fatigue one tends to be less accurate and less alert to existing dangers and tends to be less cautious in avoiding the spoiling of material or personal injury. When attention is required to keep up the pace of activity, it is diverted from other channels. The tired workman becomes more aware of his feeling of tiredness and less aware of other things about him.

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Perhaps, because of the increase in reaction time, due to the effect of fatigue, the individual becomes more prone to accidents. Many jobs require comparatively fast reaction time for safe performance. It is true that the reaction time of different individuals may vary greatly and yet each may work safely. The real danger comes when an individual has set up his pattern of safe operation on the basis of his own normal reaction time and then that reaction time is interfered with. His general pattern of performance continues but his new slow reaction time does not fit the pattern and so he gets into trouble.

Accidents Near the End of a Shift.—Allowing exception for the accidents that occur at the very end of a turn, there are fewer accidents near the end than during the middle of a shift. This has been explained by the fact that production is decreased near the end of it. Even if fatigue is high at this time, the accidents are likely to decrease because the other contributing factor, namely, rate of production, has been decreased. Even a fatigued person may work in comparative safety if he goes about his task slowly enough.

Actually, accident rates near the end of the turn are high in comparison to production rate. This probably provides evidence that the factor of fatigue is still active while the factor of speed of production is decreasing.

Physical fatigue should be greatest near the end of the turn. But, what sometimes happens is that

with increasing fatigue has come a slowdown in production and a reduction of fatigue as a result of decreased activity. Furthermore, although fatigue may be greatest at this time, there are mental factors coming into operation near the end of the turn. Some men become aware that the shift is about over and permit this to influence their thinking. This results in both good and ill as concerns safety. In the case of those who give close attention to their work as a result of the "quitting-time" stimulation, there is likely to be a decrease of accidents and perhaps an increase in production at the very end of the shift. In the case of those who begin to be distracted by plans for activity after the turn is finished, there is likely to be decreased production and less attention to safe performance. Apparently these two do not cancel each other. The former type seems to be more numerous than the latter in most industrial situations. If it were not so, it would be very difficult to account for the end spurt in production with the accompanying low accident rate, except for the sharp upturn in accident rate, just at quitting time.

Length of Workday and Accidents.—With the shortening of the workday, there was a decrease in accident frequency. This decrease was not all due to the shorter time in which the individual was on the job, for the rate was computed on the basis of the number of hours worked. There may have been several factors entering into the situation but apparently the decrease in the length of the working

day was one of them. There are seemingly no records, however, to show that the frequency rate was higher during the last four hours of a twelve-hour turn than during the middle of the turn. The statements of those who remember the long turns, seem to indicate only that the peak period of accidents came at a later time after the beginning of the turn than is the case in the present eight-hour turn. Just how much of the decrease in accidents accompanying the shortening of the workday was due to the factor of less fatigue we will probably never know; thus, we may only assume that it was an important factor in that decrease.

Monotony.—Monotony seems to be related to accidents in a positive direction. The greater the feeling of monotony on the part of an individual, the more prone he seems to be to get into trouble.

The feeling of monotony is usually followed by a loss of interest in the task. This loss of interest probably accounts for the relationship between monotony and accidents, for the disinterested person is not attentive to correct and safe practices in the performance of his task.

A motorist tells of a near accident on a long straight level stretch of road in the Middle West. He had been driving at sixty-five miles an hour for some time when he suddenly found that he was off the road and heading for a ditch. He managed to bring his car back to the road without too much difficulty. He had been overcome by a feeling of monotony in the driving situation and to use his words, "I

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had lost all interest in driving, but forgot to slow down; my mind was just a blank, or if I was thinking I can't remember what it was about, but I certainly wasn't showing any interest in my job. There I was, just innocently inviting an accident to happen."

Probably even worse than the passive loss of interest in a job that is considered as monotonous is the active development of an interest in ways and means to escape the monotony. If this interest is not properly guided, it sometimes takes the channel of the formation of incorrect and unsafe methods of performance, which endanger the individual and decrease his efficiency as a worker.

A third way in which monotony is related to accidents is that the individual builds up a defense against that feeling by daydreams in which he may escape. Very few individuals are capable of accepting a world in which they are annoyed or bored or which causes them to have a feeling of futility. They attempt to make the world over to suit themselves. This is difficult to do in reality, because material objects and other human beings resist the attempted changes. Therefore, the person who cannot accept the real world as it is, and cannot change it, builds a more satisfactory world in his imagination. He daydreams. From some of these daydreams may come the creative inventions and arts that make for progress and improvement. But, all too often the daydreams are so far from any possible reality that they do not fit the actual life situations.

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Such daydreamers are dangerous, because they adjust to the stuff of their dreams rather than to the actual situation in which they are. Furthermore, energy and attention which should be guided into safe performance are sidetracked, to be used in continuance of the oftentimes useless daydream.

To eliminate the accident hazard caused by monotony, some way must be found to reduce or eliminate it.

No Task Is in Itself Monotonous.—Monotony does not reside in the task. It is rather a state of mind of the person doing the task. It is doubtful if any job could be found which would prove monotonous to everyone who might try it. There are, however, some jobs that are more often considered as monotonous than others; that is, there are many people having a feeling of monotony when they do that particular task.

What is the nature of a job that proves monotonous to many people? Almost any job that demands constant attention, but affords no challenge or offers no compensation commensurate with the attention demanded is considered monotonous by most people. On the other hand, there are some people who like a routine job and never complain of monotony. Routine jobs are not monotonous if the persons doing them find other interests to occupy their time, without interfering with the habit pattern necessary to the doing of the task.

An operator at the electric controls of a rolling mill in a steel plant had been operating the six con-

trols steadily for half an hour, when there was a break in the line of ingots coming to the mill. At this pause he was asked if his job was monotonous by one who was very much overcome by a feeling of monotony from watching him. The answer was given with a good-natured laugh. The operator said that there were three reasons why he had never had a feeling of monotony. First, he was very well paid, and the faster the ingots came the more money he made. Second, he felt the importance of his job, because the earning power of the rest of the crew on that mill depended upon how he operated. Third, reading the dials and fingering the controls had become so well established as a routine habit that he could, when things were going right, think about and plan his garden without any interruptions. He dwelt on this idea of garden planning as the chief reason why he had no feeling of monotony. It seems that during the summer he turned every vacant lot and weed patch in his end of town into a flower or vegetable garden on the basis of the plans he laid while at work throughout the year. He had made habitual all the routine activities of the job and had found a way to challenge himself with other secondary interests which did not interfere with skillful operation, but which did take his thoughts away from the disagreeable factors of the job. Along with this he had developed a habit of looking for certain specific details that might go wrong and of directing his attention to any unusual situation.

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His foreman spoke highly of his efficiency record and of his cooperation, fine attitudes, and loyalty. He had never been involved in an accident and was a wholehearted supporter of safety.

Monotony May Be Decreased.—In the foregoing example, it appears that monotony may be decreased or eliminated in several ways. There may be some additional factors that will help in its reduction.

First, men should be selected for jobs that are within the range of their abilities. This means that men with extremely high abilities should not be put on jobs which in no way challenge them or reward them in proportion to their efforts. It also means that men of low abilities should not be put on jobs that require every bit of their attention just to do the job, but provide no challenge for them and at the same time no relief from tension.

Second, monotony may be reduced by rest periods or change of activity. Other things are thus provided to break the tension. Furthermore, the rest period usually makes the man feel that something is being done in his interests and in his behalf. This promotes a good attitude and does much to eliminate thoughts of self which lead to a feeling of uselessness and monotony. The change of activity, where the job setup permits, is often quite as effective as the rest period with the exception of the psychological reaction to the effect that something special is being done for the individual.

Third, an increase in pay is one of the very effec-

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tive ways to eliminate monotony for a short time. Most men do not have a feeling of monotony when they feel that they are getting high compensation for their efforts, or that they are being promoted in the direction of high pay. However, the good effects of a pay raise may soon wear off, and the monotony will then return unless other factors are controlled. Of course, another raise in pay will help at this point, but there are definite limitations to the amount of pay available for a job, such as the readiness of the worker for pay promotion, the union agreement, and the final rate which may be paid. Pay raises should not be made only on the basis of the fact that they reduce the feeling of monotony; but when they are given because of other justifiable reasons they do serve as a factor in the reduction of the feeling of monotony.

Fourth, special rewards fall into the same class as pay raises and must be handled as carefully. Among them are promotions in job level, job location, title, and special recognition and citation for efficient work, safe practices, good attitudes, and the like. All of these help to reduce the feeling of monotony when they come as a justifiable result of the activities of the person involved. None of them should be used for the sole purpose of reducing monotony, because of the attendant dangers in the area of wrong attitudes when the reward is not justifiable. If supervisors would only learn these principles, they would have far less difficulty with their workmen. If wrong attitudes are developed, more unsafe prac-

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tices will be promoted than can be eliminated by the reduction of monotony, and undoubtedly a later increase in monotony as an outgrowth of bad attitudes will be the final result.

Fifth, when all the other factors fail to remove the feeling of monotony because of limitations in their application, there is left the possibility of arousing secondary interests which do not interfere with the necessary routine of the job. If the job itself is interesting and challenges close attention to development of interests, so much the better. However, if the job is purely routine and the one doing it is not supposed to develop new methods or to promote changes in attacking it, a necessity for the development of other secondary interests is indicated. Arouse only such secondary interests as will not defeat the purpose of the task, nor interfere with its being properly and safely carried out.

The supervisor is responsible for the arousal and direction of the interests of those whom he supervises. He must direct attention to the points that follow into the proper channels. It is well if the job is of such a nature that it provides a challenge to the worker to develop new methods which will serve to attract his attention and interest. If this is not the case, other interests must be encouraged by the supervisor.

In many industrial plants, the feeling of monotony is reduced by means of promoting the interests of the workers in club and other activity. Here there is one point on which the supervisor

should be cautious. The club activities should be kept in the area of means of relieving tensions. They should not become ends in themselves which increase tensions. The plant athletic team sometimes becomes more important than the production line. In one case, the tension was so great concerning the baseball team that special players were hired to play on the team to win games and the general run of workers were told that they were not wanted on the baseball field except as spectators at the regular games. The tension from this situation did not help the accident record in the plant. One day the workers struck with the simple demand that "the company *play ball* with the employees in every way." The strike was settled by a very slight rate increase and the elimination of a professional ball team in favor of intraplant athletics.

The personal interest of the leader in his followers and in the jobs they are doing helps much in arousing the interest of the individual for his job and in reducing his feeling of monotony. It is not often that one has a feeling of monotony on a job in which he takes great pride. The worker, the student, the child, even the sportsman, take pride in a job when others become interested in it and in him as he does the job.

Avoid Monotony and Fatigue in Safety Instruction.—Fatigue and monotony are related to accidents and safe practice in a cause and effect relationship, indirectly if not directly. Thus all possible effort and study should be made to reduce these

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factors. Furthermore, instruction in safe practice and safety promotion are fields of activity that may involve these same factors. Instruction and educational promotion may be made so fatiguing and monotonous that they become annoying. In this case, the one instructed usually tries to find a way to avoid the instruction. Since this is sometimes impossible, he does the next best or worst thing; namely, he avoids following the instruction that has been forced upon him.

To avoid monotony and fatigue in safety instruction it must be made vital with actual cases that are understandable to the one who is being instructed. It must be made interesting by appealing to the preestablished interests of the person, by showing a genuine interest in it yourself, by the maintenance of the highest possible relationship of respect and sympathetic understanding between the instructor and those instructed.

Too often the supervisor trying to promote safety is a "pusher" or driver rather than a leader. Most men are the victims of monotony in any situation in which they feel that they are being pushed or driven. On the other hand, men who feel that they are voluntarily engaged in a situation, will follow a leader with little or no feeling of annoyance or monotony. Even though the situation may be fatiguing, they will scarcely admit it to be such. Thus men must be *led* to believe in safety and to desire to learn more about it if the best results are to be attained.

CHAPTER XV

BUILDING MORALE

In the field of accident prevention and safety promotion, the morale of the group bears a close relationship to safe practice. The motivating forces of life not only prompt activity that may be formed into habit patterns of either safe or unsafe nature; but also are related as factors in the group social structure and the level of morale of the group.

Motives, Needs, and Wants.—We quite often hear someone ask, "Why did he do that?" At times the question means, what were his reasons? At other times the inquirer wishes to know what underlying forces caused the action.

In the study of accident prevention, in which we are looking for causes in order that they may be eliminated, we are interested in the relationship between the motives behind the act and the unsafe act which we wish to eliminate.

Perhaps all motives may be reduced to several fundamental drives or springs of action. We are first of all biological organisms. As such we have certain basic tissue *needs*, such as food, water, temperature regulation, oxygen, and the additional need for reproductive activity. These basic needs must

be satisfied. When they are not, a *want* exists. The organism *wants* what it *needs*. It acts to satisfy this want.

The activity engaged in to satisfy basic wants gets built into rather complicated patterns. These derived patterns become the *motives* of life. We need to procure food; but we are motivated to procure a definite kind of food such as sirloin steak rather than lentil porridge. Whole kernels of wheat may be nourishing but our superimposed habit pattern demands a loaf of white bread done up in cellophane. Therefore, we steal the loaf of bread rather than eat the wheat which we have in great abundance. Hunger may have been the basic drive but the motive for stealing the bread was made up of a definite habit pattern superimposed upon the basic drive.

Besides the motives based on the more fundamental drives, two very powerful and prevalent general motives are existent in most humans: the desire to be noticed and self-preservation. Individuals will engage in all manner of unsafe practices to be noticed, if they cannot be noticed for their safe practices. Notice people for the correct and safe activities and not for the unsafe ones, and they will engage in those for which they are noticed.

In the case of self-preservation, the individual may engage in specific activities that are almost sure to injure him, to promote the activity in focus of his attention which he believes will preserve him. The new man in the steel mill ran blindly ahead and

into a steel pillar to escape the shower of the fiery sparks when a ladle of molten metal was poured. He was preserving his life from the shower of sparks but unwisely injured himself in so doing.

Do Not Deny Motives and Drives.—It does no good to reprimand people for being motivated to act in specific ways. The most effective approach is to give them as much knowledge as possible concerning the best way to satisfy the basic drives which they cannot escape, and to reform the habit patterns of the derived motives. Often a clearer view of the total picture in any situation makes it possible to avoid unsafe practice while carrying out the fundamental activity demanded by the motive force which compels the activity.

Ask other individuals to do only those things that will not deny the more fundamental drives and motives of human existence. You can scarcely expect a person to respond pleasantly and safely if you ask him to do things that will rob him of home, shelter, or food, or which will hurt him physically or belittle him in the eyes of his associates. For a time, by clever methods of propaganda or stern command and punishment, others may be forced to do things that deny the basic drives of life; but sooner or later rebellion will follow. This rebellion may be in the passive form of unsafe activity or it may be open revolution. In either case the results are undesirable and could have been avoided.

Find out what the basic drives are and set the scene so that they may be satisfied safely. Find out

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what the motivating forces are within each individual and each group, and set the scene so that safe activity will result as these motives function toward satisfaction. If the motive is one that cannot be satisfied by safe activity, it becomes the duty of the leader to engage in a program of reeducation in which old habit patterns are replaced by new and acceptable ones. In other words, without changing the basic drives, the superimposed habit patterns which have been accepted as motives are reorganized.

Substitute Better Practices.—Many times the motive may not need to be changed. It may be sufficient to direct the activity arising from it into a new and more useful channel.

Pat had a very special and peculiar type of motivation. Whenever he saw a person being taken advantage of in any way, he had to smash something. Now, Pat did not attack the unjust person. He usually took his vengeance out on the furniture or dishes at home. One day his wife said, "Pat, if you must break something, why don't you take a hammer to that pile of rocks in the back yard; and if you don't, I'm the one who will see that you break rocks somewhere else where the cooking won't be so good as it is here." Pat had little choice; either he must deny the motivating force, change it, or find a better way to satisfy it than by furniture smashing. He went to the rock pile in his own back yard. There have been so many occasions when Pat was motivated to smash things, that he has now broken

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enough rock to build a nice gravel path from the house to the rock pile, and the furniture is still intact. The peculiar motivating force was not removed, but it is now being satisfied by safe and productive activity.

Sublimation simply means the guiding of activity arising from a motive which still persists from a channel of activity of lesser value to one of higher or more acceptable value.

We cannot hope to change all the peculiar motives of all the people about us or to remove the occasions that cause them to function, but we can do much to guide the resultant activity into safe rather than unsafe channels.

In any accident-prevention program it is wise to attempt to shape the motives of individuals whenever possible, remembering never to deny basic human drives. Since all motives cannot be shaped to our liking, because they are too firmly set, it is well to find out what they are and how they function in each individual. Then the task becomes one of setting the scene so that they are not brought into play if the resultant activity is likely to be unsafe, or of so directing the activity in response to the motive that it will satisfy the motive and yet be safe practice.

The father of a drowned boy tried to no avail to keep his other sons from going into the water. He could not change the motive. They continued to go into the water even though they had to do so in secret. He became aware of this and wisely took his

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sons to the best swimming instructor available. They learned how to be safe in the water and how to rescue others. In this case, the motive was not removed, but the resultant activity was guided to a higher level of performance as concerns safety in the water.

In the removal of causes of accidents it is vital that the motive behind the act be understood. From this knowledge, it is possible to reform poorly constructed or dangerous motives, to set the scene so that the motive that cannot be reformed will not function, or to refine the activity that arises from it.

Morale and Accidents Related.—It is the consensus of opinion of those interested in accident prevention that the accident frequency is comparatively high in cases where group morale is low and comparatively low where group morale is high. When group morale is low, individuals are less likely to act safely. This may be due to the fact that there is no incentive to uphold the reputation of the group. It may also be due to the fact that the individual is frustrated and under tensions as a result of the group disorder; in this condition he is not likely to perform safely.

Factors of Morale.—What is meant by high or low morale? How is high morale attained? In the first section of this chapter, we noted that motives are the springs of action. Whenever a group of individuals have a common motivator, they are likely to exhibit similar activities. Since most activity is for the purpose of advancing the individual, there is

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a common interest among members of a group when the activity of each individual is like that of others. The activity of any one individual does not deny or hinder the activity of others. There gets to be team play in such a group. This is not of necessity high morale. That comes when the members of the group come to the realization that they are working, playing, or acting together in such a way that the interest of each is being promoted not at the expense of others but to their advantage. Morale presupposes a commonality of interests, a commonality of activity, and the promotion of each member of the group and the group as a whole, through effort expended unstintingly by each in the progress of the group from which the individual draws an advantage without thwarting others.

To build a high level of morale, three things are necessary:

1. A common purpose, high enough to challenge every member of the group but not out of reach if every effort is extended. The purpose must be named or symbolized and understood by the individuals in the group.

2. A commonality of interests. Either each individual must have the same interests or the group must be so organized that it accepts the principle that the varied individual interests are all contributing to the same general principle. Such a group has high morale, unless the interests of one individual are advanced at the expense of the total elimination of those of another member.

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3. A definite plan to "give and take." Each member of the group must give all he can to advance the group and its individual members, including himself. He must, by the same sign, at times deny himself in order to advance another individual whose advancement at the specific time is most important to the group and will reflect back on him indirectly as the group succeeds. This is the rock on which the ship of morale is so often wrecked. It is difficult to give way to another even though at a later date it may prove an advantage.

Any group that follows the above principles is likely to have high morale. The group so constituted will tend to promote its own existence. Thus it will eliminate the unsafe practices that will cause injury to any of its members either physically or morally. It is easy to promote safety in such a group. In fact the group usually assumes, as one of its duties, the promotion of the correct and safe techniques in the performance of its activities.

Interest and Morale.—Granted that you start with a group possessed of high morale, how will you continue the group without losing morale? You must discover the *interest factors* of each individual. There are some general interest factors. Everyone is interested in himself more than anyone else in the world. Then see to it that the group activities give each member the opportunity to advance his own self-interest. He may have to be shown that this is best done by advancing the whole group made up

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of other individuals whose interests he must not deny.

Most members are interested in their families. Then do something that will permit them to exhibit this interest. A coal mine superintendent found that the best way to promote safety among the men was to have a "family night" every so often in which half an hour was given to a discussion of safety, and the remainder of the evening to getting acquainted with the families of whom the men were proud and in whom they were interested.

Most members of a group are interested in their hobbies. Then show some interest in their hobbies and let them express themselves to the group through them.

There are many specific interests held by the members of the group. If you are the supervisor, you must find out what these specific *interest factors* are for each individual. You must then be interested enough to give some attention to them. If you do, the individual is a friend of yours and the cause you represent.

Not only is high morale, which in itself is conducive to safe practice, induced by proper attention to interest factors; but the group with the high morale will follow the safety instruction of the leader who represents the group to them.

"Being Liked" and Morale.—The members of a group in which the morale is high like each other. After all we do tend to like those who have the same

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interests as we have, who help us promote our interests, and who like us.

In many life situations, organized groups are put together owing to other reasons than their common interests. These might have drawn them together if we accept the fact that they may all have a common interest in having a job to earn a living. Children of different interests find themselves in the same family. There is only one school in the community and everybody goes to it. Twenty-five men have jobs in the same department in the mill. Suppose you are the appointed leader of any one of these groups and that among the other things, you must promote safe practices and correct activity. Suppose also that you have done all you thought possible to create high morale, because you know the value of it in accomplishing your responsibilities as the leader of the group. Then suppose that on taking inventory you discover that the morale is not high enough. On further thought you realize that the reason it is low is because three of the members of the group just do not like you. What will you do about it?

You may conclude that the morale is high enough to satisfy you. But it may not satisfy those who expect better results and are paying you. You may decide that you will get rid of the three who are disrupting the morale of the group. You cannot do that. Only gangsters "rub out" the members of the gang who do not conform. Then you may say that you will make the three offenders like you, since you

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must keep them and since, as long as they do not like you, the morale is low and unsafe practices are flourishing. Fine! But how will you make those three like you?

You may command them to like you; but they will not. You may tell them it is to their advantage to like you. They will probably laugh at you and dislike you the more. You may even discover that you do not like them. In fact it would be peculiar if you did like them and they did not like you. Here is the secret of the problem. If you could only like them, they would probably like you and make every effort to go along with you and the group.

Somehow or other you do not like everybody and here are three you just cannot like. There are two answers to that. If you cannot find a way to like, really like, all humanity so that you will stoop to help the least desirable to something better, then you have no business being the leader of the group by appointment or otherwise. So quit your job and make room for someone who has the quality you lack.

The second answer is that you will find a way to like even the three rascals until they learn to like you. When they do and you have common interests, even though they be on a low level, you can begin the long task of slowly changing that common interest to the level which the ideals of your appointment require. Let us not be so foolish or impractical as to suppose that everything will be so beautiful in every actual case as it sounds in theory, but it is

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worth trying because it does work to a surprising degree. You must find something to like in every man you supervise.

When you have brought the last holdouts safely into the fold because they like you, who first liked them, and when they are liked by others in the group because you, as the supervisor, have exposed things in them to be liked, the morale is ready to go to new high levels. You must then name and symbolize those levels so that they challenge every member without being out of reach and without denying the interest of any individual. Then you may promote safe practice or any other worth-while objective that does not deny the motivating drives of anyone in the group. Under such leadership safety can be taught and safe practice will result.

Lest you say that this has more to do with moralizing than morale, let it be added as a challenge that you give these principles an honest trial in any area of life in which you propose to be a leader. They have worked where they have been honestly applied. Do not cringe when people accuse you of being religious when you propose such principles. They are sound not only from the viewpoint of religion but also from the viewpoint of psychology and common sense; and we need more honest adherents to all three if we propose to build for mankind a world in which man will live happily and safely.

CHAPTER XVI

DISCIPLINE, REWARD, AND PUNISHMENT

The term "discipline" may be defined in two ways. First, it may mean a set of rules and a procedure of training. That kind of discipline is usually good; it denotes planned teaching of the socially accepted ideas of the group. The second meaning of the word refers to the reprimand or punishment that is meted out when there are deviations from the accepted form of conduct. It is this latter idea of discipline that we wish to discuss in this chapter.

Safe practices must be learned. They will probably be learned if the individual is punished for failure to learn them. On the other hand, they will be learned more readily if he is rewarded for learning them instead of being punished for not learning them. The same holds true of attitudes, which are learned habit patterns of thought concerning safety.

It will often be said that some men will not learn safe practice until they are punished and that they will not do things for their own safety unless they are disciplined for failure to do them. If such is really the case, then discipline must be used to protect these individuals. It is doubtful, however, if

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such is the case with the majority of those of whom this is said.

Men who do not wear safety shoes, when the plant rules demand that they wear them, may be forced to wear them. If you insist that they obey the rules, all those who fail to do so must be disciplined. If there are a sufficient number who object, you may have open rebellion to the orders and, worse yet, defiance in the face of the disciplinary measures applied to force obedience to the command. This leads us to the question as to whether some other method may not be better to solve the problem.

Industrial employees are fairly well entrenched in their jobs. It is difficult to get rid of them. If they fail to follow orders, what can you do about it? Fire them! You may have to fire them all. The union may make an issue of the situation.

It is only when the majority of individuals follow a given idea that those who fail to follow can be disciplined at all. Those who follow do not need to be disciplined for infraction of rules. Those who fail to follow can be caused to follow by some better method.

That better method must be determined in each individual case. When all possible methods known by the supervisor have been tried and none of them work, the offender may have to be disciplined and punished. If he is in the minority, the punishment may be effective.

It is well to remember that all discipline and punishment are admissions of defeat. If a man must be

disciplined for breaking the safety rules, it is because he has failed to learn those rules, or has failed to desire to obey them, or has failed to give attention to obeying them. In any case, there is a failure. We are hasty to assign that failure to the man who broke the rule. Whether it be his failure or that of the one who was responsible for training and supervising him, it still remains a matter of defeat of the primary idea of safe practice.

Let us suppose that the man broke the safety rule because he had never learned it. In that case, it is undoubtedly the failure of the supervisor whose responsibility it is to teach and train the men. He is there for the purpose of instructing and not for the primary purpose of punishing those who fail to learn what he has failed to teach them. The same is true if he has not learned the proper attitudes.

In safety, it is the duty of every supervisor to find a way of teaching each individual. If the way he uses leads to failure, it is his failure. He must find a better way. He is being paid to teach safe practice and proper attitudes, and not to punish those who have failed to learn.

It would be a better world if teachers, whether they are in the schoolroom, in the industrial plant as supervisors, or in the home, would admit that every time they find it necessary to mete out disciplinary punishment, it is because they have been defeated in their efforts to teach and train to a predetermined standard. Such an admission of defeat places the guilt for failure in the place where it quite

often belongs. Having admitted failure and defeat, the teacher may find either another job or a better way.

The correct attitude on the part of the instructor is to try to find a way to avert failure. The improper attitude is that of the *quitter*. It may be exhibited in several ways. The instructor may just admit defeat and do nothing more about it. He may lower his standards so that everybody conforms to what he demands, even though it be far less than acceptable when compared with what is generally expected. He may pass the blame back to the one whom he is attempting to teach. Of course, that is the usual method. It does somewhat save the instructor's face if he can bring partially acceptable evidence to show that the student lacks intelligence enough to learn what he proposes to teach.

Sometimes the fact is that the individual does lack considerable intelligence. In that case, the instructor just has a more difficult job to teach him safety in order to avoid the consequences of failure and defeat.

It used to be the general practice, and too often still is, to punish and discipline men who failed to learn the proper safe practices and safety attitudes in industry. It must become the practice to find special means to teach and train them. It may require specially trained supervisors, who will find a way to teach them to be safe and safety-minded, and who will not put dunce caps on them when they fail to learn.

After every effort has been tried and you have reached a point where further effort seems useless, or where time and energy do not permit, or where the cost is too great, it is still futile to punish. In that case, the individual worker may have to be shifted to a job where the safe practices are within his grasp, or he may have to be dismissed with the admission of defeat due to limitations. Such dismissal and admission of defeat should be saved as a last resort after everything within the limits of time and cost has been tried.

Taking the Consequences of Discipline.—Whenever discipline is used as a means for teaching men to be safe in their acts, there may be two types of consequences. First, it may be possible that the discipline actually accomplishes the purpose, which could have been accomplished in some other manner. Second, there is always the possibility that secondary consequences may arise which are undesirable, even though the primary purpose has been accomplished. These secondary consequences cause men to become rebellious against ideas that they are forced by disciplinary measures to accept. Furthermore, the usual result of discipline is the development of an attitude of face-saving, revenge, or fear by the one disciplined.

Although the immediate problem has been solved, the further safety promotion has been jeopardized by the undesirable consequences. Men who are rebellious, revengeful, fearful, or who are trying to find a way to save face, are likely to be unsafe in

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their acts and are not likely to accept readily any further safety instruction. They may even expend their effort in working against safety attitudes on the part of fellow workmen to justify themselves.

Does all this mean there is never to be any discipline or punishment for those who break rules? No, certainly not. There are times when it is impossible to escape the use of punishment. In an orderly organization, rules and codes are set up. They may be set up to give positive guidance. If they are respectable, they must be enforced. Otherwise, they should not exist. If they are broken, punishment must follow. This is not punishment because of a failure to learn, but punishment as a result of infraction that is deliberate or due to lack of attention. Such punishment is usually set up as a part of the code or rule, and is accepted as a standard price to be paid for deliberate or inattentive infraction of the rule.

When the rule is taught, the punishment for infraction should be announced. The rule should be taught by positive means and not by punishment which comes as a result of the infraction.

There are times when a "here and now" situation demands discipline to solve the immediate problem. It may be that someone has failed previously, but the situation now demands immediate action. A man may have left his goggles at home and his foreman may have to refuse to let him work on a grinding wheel without them. This is a type of punishment. At least it is the penalty the man pays for

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forgetting. Suppose the foreman permits the man to work at the grinding wheel and nothing happens to his eyes, or that the man began to work before the foreman noticed that he did not have his goggles. Such being the case, there has been a definite infraction of rules. It is the duty of the foreman to stop the activity to save the man from possible injury. He must be penalized by discontinuance of work until he obtains his goggles. This is a form of punishment that must be administered to save an immediate situation.

In many cases, added punishment is inflicted. The man is reprimanded severely, reported to the safety committee, or laid off for several days. This added punishment is usually unnecessary in the case of a conscientious worker and causes unnecessary irritation. In the case of the worker who is not conscientious, a good plan for teaching and training him to be more conscientious would be more effective than added punishment and further discipline. They usually serve only to give him more personal justification for his already bad attitude.

It is much better to plan reward for the safe practice and attitudes of safety attained, than to plan punishment for the failure to attain the desired practices and attitudes. This is true, both of the new individual who is being trained and of the experienced individual whose attention must be constantly directed toward the carrying out of practices with which he may be familiar. The reward in every case should be a direct result of the proper

practice and attitude if it is to have motivating value.

Detached Reward and Punishment.—In the use of either reward or punishment as a consequence of the action of the individual, all too often a separate punishment or reward is administered which has no actual relation to the thing done. At best it is only thought to be related. It may seem to be related as a consequence, as it is viewed by the one who grants or administers, and may not be recognized as having any relation by the one who receives it.

Punishment for infraction of safety rules is sometimes very uncertain in its relationship when viewed by the one being punished. The man who removes the guard from his punch press because it hits him in the hand, has definitely broken a safety rule. If the foreman reprimands him for so doing and punishes or disciplines him for it, the direct relationship of the punishment to the bad practice may be evident. If the foreman lays him off for three days and scolds him for not telling him about taking his action, the discipline or punishment may, in the mind of the workman, be due to the fact that he did not tell his foreman what he had done.

An even worse situation of mistaken relationship results if the man tells the foreman that he has removed the guard and the foreman punishes him and leaves him under the impression that he is punished because he has bothered the foreman by telling him what he has done. In the future, when he takes off a guard, he will not tell the foreman, in the hope

that he will not get into trouble. Of course, the foreman may see the situation some day and correct it, or the man may lose a hand in the press. The punishment must be clearly related to the situation for which the individual is being punished, so that he can make no mistake in his thinking about it.

To be sure, the most effective punishment is that which comes as a direct result of the malpractice, but the very malpractice itself must be avoided. Perhaps men could be taught not to put their hands under unguarded punch presses if by doing so they lost a finger or two. There is no doubt that such punishment is direct and effective and would be likely to cause the man to avoid ever putting his hand under the press again. The only difficulty is that such punishment is too costly and is already an evidence of unsafe practice. The man must be taught by some other way to avoid such action. Properly told, the misfortunes of others may serve to instruct him. The man may even be punished for removing the guard from his machine; but, be sure that in his own thinking he knows that the punishment is for that act and not for something else.

So often punishment becomes so detached and so far removed from the act for which it is meted out, that the relationship is entirely lost. Then the punishment does not motivate toward avoidance of the act. It then motivates the individual to avenge the wrong that has been done to him. If you must use punishment as a last resort, be sure that it is di-

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rectly related as a consequence to an act that should have been avoided.

If punishment cannot be avoided and has been used as a last resort, properly related as the direct consequence of the improper practice, two things must follow under good supervision. First, the supervisor must give the disciplined individual every opportunity after the punishment is completed to reestablish himself in his former position of respect both as regards his fellowmen and his supervisor. This requires planned contacts with him to find what his attitudes are, so that they may be properly guided. It also requires closer personal interest in the things that promote his welfare, not in a patronizing way, but as a respectable friend. Don't *ride* him; he has paid. Let him feel that you are a gentleman and expect him to be the same. He made a mistake and paid for it. Do not bet against him, lest he make another error and defy you while so doing.

The second point to which a supervisor must attend, when an inevitable punishment has been meted out, is that of finding a way to correct the failure on his own part in not having fortified the individual against lack of knowledge or improper attitude. He must plan and carry out a method of instruction that will avoid the same thing's happening again. At times, he must even admit his failure to have found the proper means of fortifying the victim. In so doing, he gives the individual a chance to save his own face (we all need that

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chance) and it establishes a mutual respect. Of course, the supervisor must be sure that the individual was not punished for the supervisor's failure, but that he actually deserved what he got and understands why.

In planning the further instruction of one who has been disciplined, it is well to have him help analyze what he lacks and lay the plans for the course of training to be followed. It should be a plan of mutual helpfulness rather than a forced set of rules that must be learned because the supervisor says so.

Reward, like punishment, should be directly related to the act for which the reward is made. Unlike punishment, which should be avoided wherever possible because of its negative secondary consequences, reward should be given wherever possible because of its positive secondary consequences. Not only does the reward actually motivate further activity along the same line, but it also results in pleasant feelings and promotes further good relations and attitudes. Morale is built up rather than destroyed when reward is properly given.

Reward is most effective when it is intrinsically a consequence of the act. Detached rewards, which are superimposed, sometimes get attached to the wrong causes and promote something other than the acts that brought them about. The man who is unduly praised for his unbroken safety record by the supervisor who did not know that he was out for two weeks because of a foot injury at the end of his last shift before vacation, may feel justly rewarded

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for not having reported the injury and for having paid ten dollars of his own money to his family physician. He could not afford to pay the bill, but he was proud of his own record and of the record of his department. He knew that at the end of the year he would be rewarded by a citation before the whole plant at the annual safety banquet. So he kept his secret, for no one had seen the bar fall on his foot that day. In his mind the reward of being cited was so important that the more important thing of keeping exact records of accidents and planning methods of avoiding them was secondary. The reward came as a result of not reporting the accident. This was a case of an entirely misplaced relationship.

Safety should be taught with the emphasis upon a whole healthy body and a mind at ease as the best reward for safe practice. The man who avoids accident and injury to himself and others provides for himself, his family, and his fellow men the opportunity to enjoy things in life that would not be possible if he caused an accident to others, or was himself the victim of an accident due to his unsafe practice or improper attitude. These facts should be placed up as being the greatest reward of safe activity.

The special emphasis on security of job, security of earning power, and social responsibility is quite often effective as a reward for safe practice. Here, however, caution should be used lest these things become ends to be attained by means other than safe

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and efficient activity, and lost sight of as natural consequences of such activity.

The appeal to the man to reduce accidents so that costs may be reduced is effective only if he sees the connection between reduced costs and promotion of his own interests through increased pay or increased job security. If he fails to see this connection, whether or not it is pointed out to him, he no longer considers the reduced cost as a reward for safety. He rather begins to see his safety resulting in reduced cost as a special boon to the company, and forms the attitude that all the interest the supervisor has in safety is not for his benefit.

Owing to the very struggle for existence and the motivating force of self-preservation, every individual is the enemy of the group in which he finds himself unless he feels that he has a common purpose with that group. He must feel that the group is promoting his interest. Too often the workman in industry feels that the interests of the company are primary and that he is excluded. In that case, he becomes, even though he is unaware of it, the enemy of the organization. Thus any reward for safety which promotes the group and makes it look as if the group were chiefly benefited while the interests of the individual were lost sight of, tends to increase the attitude against safe practice rather than for it.

It is, therefore, unwise to dwell at length upon the saving to the company or the glory to the organization, the safety director, or the foreman,

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which comes as a result of safe practice. This is a reward to the group and the individual begins to feel that the program is for someone else. It does not promote his interests; therefore, it must defeat his interests. Unless he can be shown and he actually believes the relationship between the company welfare and his own interests, he is likely to work against the organized safety program of the company. Men have been known actually to commit unsafe acts endangering and even injuring themselves, just because they did not care to promote the company's safety program.

The promotion of safety should bring a definite reward to the man who promotes it. Since that man is every man in the organization, the program should be so set up that every man realizes the promotion of his own self-interests as the most direct and most acceptable reward for his safe acts and attitudes. Not only does this build better safety habits and attitudes in the individual, but it increases the *morale* of the group and develops a commonality of purpose which makes the individual feel and act as a part of the organization, willing to promote its program, rather than an enemy who must defeat the organization to gain recognition for himself in his struggle for self-preservation.

A well-organized safety program, which thus promotes the interests of each individual as a reward for his safe acts, not only induces more safe practice but makes for better morale, which is effective in reducing cost of production through both more effi-

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cient effort and added attitudes, and activity of further safe practice.

Special Awards.—Special awards have been used in many cases with marked success to promote safety. In other cases they have been ineffective and at times even harmful to the general program of safety.

Perhaps the citizen of Evanston, Illinois, was not just a pessimistic grouch when he scoffed at the idea of Evanston's receiving the National Safety Council award for traffic safety for the year. He was of the opinion that all of the fine effort in education for traffic safety both of the automobile driver and the pedestrian was very excellent; but that, since the reward was such a desirable one, perhaps more effort would now be given to announcing how good Evanston had been rather than to furthering the educational effort. He pointed out that already a traffic officer had scolded him for crossing the street in the middle of the block rather than at an intersection, because it would spoil the record and Evanston wanted that award again. He said that the officer was so proud of the award that he did not have time to be considerate of him. The officer even suggested that if he wanted to get himself run over he should go across Howard Street which separates Evanston from Chicago. That was a case of misplaced emphasis. The good but somewhat careless citizen felt that the award was far more important to Evanston traffic officers than was his personal safety.

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Special awards sometimes spur a group on to added effort to do the things that must be done to merit them. If such is the case, the award has served its purpose well. However, if the award becomes an end in itself to be gained by any means, fair or foul, disregarding the activity that forms the basis upon which it is merited, then the award is detrimental.

In order that his department might be cited as having the best safety record, a foreman scolded his men regularly concerning safety. He scolded those who came with minor injuries. He failed to report two lost-time accidents as such and threatened to fire the men if they reported. He was after the departmental safety award. He told his men they could work any way they liked but, "by the powers" not to have an accident. He got the plant safety award for his department, a nice plaque with a bronze shield bearing his name and the name of his department. He hung the plaque in his office.

The men of the department knew the truth of the situation. They made up a list of all the unreported injuries during the year and sent the list to the plant superintendent, to the safety director, and to the foreman. They also requested a new foreman, and they got one. Under his supervision, they did not get the safety award the next year, but they did attain a good safety record. The award was discontinued.

A great deal of caution is necessary in the use of departmental awards, lest overzealous supervisors

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and workmen defeat the real problems of safety in order to gain the reward. There is no value in covering the evils that exist. They should be exposed frankly and without malice in order that they may be studied to find ways to eliminate them and prevent their results.

Individual awards often lead to the same covering up of facts. There is an added danger in individual awards. Other men become jealous of those who attain them and sometimes do things to spoil the record of the one who may merit the honor.

Instead of awards of a positive nature, sometimes negative awards are given. The "safety pig" or the "white elephant" is given to the department having the most accidents during a given time or to the department with the fewest lost-time accidents. In some plants the safety director will vouch for the effectiveness of this method. In others the reaction has been unfavorable. Where the reaction is favorable, the same results could most likely have been obtained by an educational program planned without the use of the negative award. Of course, there are some of us who must have a pig or a white elephant as a symbol to spur us to action.

The dangers that arise from these negative awards are very likely to outweigh any advantage they may have, that could not be obtained by some more positive method.

In one plant the white elephant, placed in a department because a man crushed his hand, made another man so mad that he kicked the elephant,

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which was made of very substantial wood. A fellow worker laughed at him and asked if the elephant objected. Even if the elephant did not, the man did, and in the fight that followed, another lost-time case due to a fractured arm resulted. Not every department will include such foolish men who get into trouble over white elephants as negative awards, but there are other bad reactions.

The "safety pig" standing at the entrance to one department caused the men in one plant to have the "jitters" so badly that they couldn't work safely. Their accident rate went up. They hoped some other department would have more accidents and take the pig away. In a union meeting, they finally demanded that all such negative awards be discontinued in the plant. The union representatives made the wishes known to the management with an ultimatum. Of course, the pig was removed at once, but labor-management relations and safety promotion were not enhanced by the whole episode.

Negative awards suggest negative activity to some men. A worker, watching the colored lights flash on a board at the plant entrance to indicate the departments that had accidents and those that had none for the week, came to the conclusion that if the plant was going to advertise every time the department had an accident there was not much use in being careful. The company was proud enough to advertise it so what difference did it make? He was informed that the company was proud of the green lights indicating no accidents. His prompt

DISCIPLINE, REWARD, AND PUNISHMENT

reply was, "Then, why don't they leave the red lights out? They only make a fellow nervous."

If awards are to be used, they must have value as motivators and give positive direction to desired activity. They must not become so important as ends that they lose their value as a means of promoting safe activity. They must remain as means used only to promote the interests of the individuals as members of the group for the advancement of the whole group. Care must be exercised to avoid the use of any practice in the use of awards that will show favoritism to those who do not merit the honor, and to avoid covering of facts to keep the record clean to obtain the award.

The supervisor who has a close personal interest in the welfare of each individual in his group rarely resorts to punishment. He plans what must be done for each worker, to develop in him safe practice and the attitudes of safety which bring their own reward.

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